RBS
The Royal Bank of Scotland

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Headwinds

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“Exit too soon, and you will kill the recovery. Exit too late, and you sow the seeds for the next crisis. We recommend erring on the side of caution, as exiting too early is costlier than exiting too late.” Dominique Strauss-Kahn, IMF

Goodbye to the Noughties. Commodities to the fore in the 2010s.

So it’s farewell, adieu and arrivederci to the Noughties and welcome to the 2010s, appropriately beginning with the Chinese Year of the Tiger. Commodities have this year performed the ‘feats of a lion, in the guise of a lamb’. Since end-2008, the RBS Base Metal Price Index has risen over 80% and the CRB commodity index by over 30%, one of the best years ever for commodities.

RBS forecasts world GDP growth of over 4% pa in each of 2010 and 2011

The world recession appears to be over and the expansion phase of the business cycle is under way. But the simplicity of the risk-off/risk-on commodity trades of 2009 is likely to become more complicated in 2010. The V- or W-shaped recovery debate was strongly polarised, but views have now coalesced as both camps fret about the risks associated with unwinding strategies. H210 could be pivotal when the ferocity of the headwinds intensifies and investors may have to ask, “Is this is as good as it gets?” Monetary policy normalisation, rising interest rates and taxes, the unemployment and debt burden and producer capacity reactivation – all scream prudence.

Prepare for a price relapse in 2010 as exit and unwind strategies occur

We remain bullish commodities for 2012-13, but we forecast that base and precious metal prices, after a resilient Q1 10, are likely to pause for breath for 12-18 months whilst the supply side gets into its stride. In terms of preference, our hierarchy for base metals is copper, lead, aluminium, zinc, with nickel still least favoured. For precious metals, platinum and palladium are again likely to outperform silver and gold. We forecast the big winners for 2010 will be the bulk commodities iron ore, thermal and coking coal, which are all playing price catch-up in their annual contract negotiations. Oil should not be overlooked, with US$80/bbl pencilled in for Brent in 2010 and US$100/bbl by 2013F.

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Commodity Companion No.5

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We thank our research colleagues across the various RBS asset classes for their invaluable contributions to this Commodity Companion.

Wishing all our readers every best wish for 2010 – The year of the Tiger.

Commodities in a nutshell

Aluminium (transport, packaging, construction)

- We continue to warm towards aluminium, which has been elevated up our base metal ranking with spot metal trading at a 14 month high. Aluminium offers the best base metal upside from current price levels in the longer term.
- Aluminium is particularly geared to the upcoming world economic recovery and we expect demand growth of 10% pa in 2010. Half of the producer cutbacks of ~7mtpa have already been unwound and a much diminished supply surplus is expected for 2010. Deficits return by 2012F.
- Yes, an onerous inventory overhang has to be eroded, but the pace of inventory build has almost stopped. We forecast that the aluminium price will top US$3,000/t in 2013F.

RBS aluminium price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**100**	117	75	100	110	120	135	110
US$/t	**2,205**	2,570	1,645	2,200	2,400	2,650	3,000	2,425

Source: LME, RBS forecasts

Nickel (stainless steels and alloys)

- Nickel remains our least preferred base metal, burdened with excess stocks with LME inventory now at 15 year highs of over 0.145mt and another 0.150mt in China. Aside from this, nickel has 0.285mtpa of idled capacity, plus a parade of new and expanded mines. Simply too much supply.
- Nickel is economically geared and after a sharp 11% decline since 2006, we forecast that demand will rise by 10% pa in 2010. Supply deficits will not occur until 2012-13F, finally leading to some decent pricing tension.
- Spot nickel forecast to average US$14,750/tonne in 2010 with a slow burn pop to US$23,000/tonne in 2013F.

RBS nickel price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/lb	**7.59**	9.53	6.61	6.70	7.70	8.75	10.45	6.80
US$/t	**16,725**	21,020	14,575	14,750	17,000	19,250	23,000	15,000

Source: LME, RBS forecasts

Lead (lead-acid batteries)

- Lead, the best performer in 2009, remains among our top picks. We expect the lead market to return to supply deficit in 2011-13, leaving it at least as tight as in 2006-07.
- Although the absolute peak of the last bull market may still be out of reach, we forecast that the average lead price will race to a record high of US$3,100/t in 2013. But we expect some correction in 2010 as visible stocks continue to rise.

RBS lead price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**104**	95	78	102	113	127	141	77
US$/t	**2,295**	2,084	1,720	2,250	2,500	2,800	3,100	1,700

Source: LME, RBS forecasts

Copper (electrical cable, wiring and tubing)

- Copper is still our most favoured base metal. It may not have the greatest upside from current levels but we expect the copper price to reach a new all-time high by 2013.
- Copper's demand prospects are not the best but we believe copper producers will have the most difficulty keeping up with demand once the cycle is in full swing. We forecast an underlying market deficit by 2011 and that by 2013 copper will be approaching pre-recession tightness.
- But before then copper still has work to do. A large surplus has so far been disguised by Chinese stockpiling and the stock:consumption ratio may continue to rise through 2010. We forecast a modest price correction in 2010.

RBS copper price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**308**	315	233	305	340	375	430	225
US$/t	**6,800**	6,951	5,145	6,750	7,500	8,250	9,500	4,950

Source: LME, RBS forecasts

Zinc (galvanized steel for corrosion protection)

- The longer-term case for zinc is compelling due to the thin pipeline of new capacity and the exhaustion of key mines. We forecast that the market will shift into prolonged deficit from 2012 and that the zinc price will then top US$3,000/t.
- But the zinc market has moved deeper into surplus in 2009, and we forecast another hefty surplus in 2010. Stocks may escalate to onerous levels in 2010-11, especially if material stockpiled in China resurfaces.
- Zinc may be in for a volatile time in 2010-13. It may be more exposed than some to a price correction in 2010 but would then be particularly well placed for a run-up in 2012-13.

RBS zinc price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**103**	85	75	90	98	111	129	82
US$/t	**2,275**	1,870	1,650	1,975	2,150	2,450	2,850	1,800

Source: LME, RBS forecasts

Tin (solders, food/beverage tinplate cans)

- Dire demand has tipped the tin market into large surplus in 2009 but we forecast that a strong cyclical rebound will leave it much closer to balance in 2010. Thereafter, supply constraints may lead to growing market tightness.
- We now believe that tin may have to wait until late 2010 before it starts to catch up with other base metals, but we forecast that it will eventually head towards US$20,000/t.

RBS tin price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/lb	**6.92**	8.39	6.14	6.80	7.60	8.05	8.85	6.80
US$/t	**15,250**	18,487	13,535	15,000	16,750	17,750	19,500	15,000

Source: LME, RBS forecasts

Gold (jewellery, investment, coins)

- Gold set to average ~US$975/oz in 2009, will uniquely among the metals, have had 9 consecutive years of higher yoy average annual prices. An enviable track record.
- Physically backed gold ETFs are now worth a record US$70bn. A new Central Bank Gold Agreement has come into force, but even central bankers like gold, with India buying 200t of gold from the IMF. Where are the sellers?
- Gold is the gift that just keeps on giving. Since January ‘09, we have left unchanged our 2010 price average of US$1,000/oz. We are now soft-peddling on our price stance as gold starts to face headwinds of an end to the gifting season and a stronger trade-weighted US dollar. By 2013F we see gold averaging a record US$1,300/oz.

RBS gold price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**1,115**	872	975	1,000	1,075	1,200	1,300	825

Source: LBMA, RBS forecasts

Platinum (vehicle autocatalysts, jewellery, coins)

- Platinum has outperformed gold in 2009 and we forecast that it will continue doing so in the coming years. We forecast that platinum will eventually head back above US$2,000/oz, with a premium over gold of US$750/oz plus.
- Autocatalyst demand can be expected to recover strongly and underlying trends in jewellery demand are robust. Against this, South African supply will remain constrained.
- We forecast that the platinum market will be in broad fundamental balance in 2009-12, so continued ETF investment can be expected to lead to growing tightness.

RBS platinum price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**1,435**	1,572	1,205	1,450	1,650	1,800	2,000	1,400

Source: LBMA, RBS forecasts

Silver (electrical/electronics, jewellery, investment)

- In traditional fundamental terms, silver is the weakest of the precious metals, in our view, and would be the most vulnerable to investor fatigue. But silver is a geared play on gold and investor appetite remains strong.
- Buoyant ETF activity has just about absorbed 2009’s large surplus but we expect sizeable surpluses to persist in 2010-11 despite a rebound in industrial demand. We forecast that silver will spend long spells below US$17/oz in 2010-11.
- However, as the surplus narrows we expect silver to become better placed to benefit from a forecast revitalisation of gold in 2012. We forecast that silver will then move back above US$20/oz, eventually topping the high of March 2008.

RBS silver price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**17.20**	14.99	14.65	17.00	17.50	20.00	22.00	13.00

Source: LBMA, RBS forecasts

Palladium (autocatalysts, jewellery, electronics)

- Palladium has been our top precious metal pick throughout 2009. Not only has it been the best performer, but we expect it to remain so in 2010-13. We forecast that it will eventually head above US$600/oz.
- We forecast that the palladium market will be in substantial underlying defict for the foreseeable future, even before ETF investment. The running down of the Russian state stockpile to feed this deficit cannot continue for ever.
- We expect autocatalyst demand to recover strongly in 2010 and beyond, yet growth in mine output may be sluggish.

RBS palladium price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**360**	351	265	400	450	550	650	400

Source: LBMA, RBS forecasts

Coal (power generation, steel production)

- In H1 09 China became a more active participant in the seaborne coal market. We believe that China will continue to utilise imported coal when supply economics or supply/demand are more favourable. Sustained Chinese imports and growing Indian demand should support higher thermal and met coal prices in the coming years.
- We expect the thermal coal market to be finely balanced with a trade deficit of ~5% in the next few years. A supply shock or growth in Chinese demand for imports could lead to dramatically higher prices, but we are not there yet. We expect the 2010 benchmark price to rise by 9% to US$75/t.
- The return of traditional Asian buyers and growth in Chinese import demand have led to tightening in the coking coal market. Whilst Chinese imports are likely to remain price sensitive, we do not expect a collapse in 2010. We expect the 2010 hard coking coal price to rise 45% to US$185/t.

RBS coal price forecasts

US$/tonne	2008	2009	2010F	2011F	2012F	2013F	LT
Hard Coking	305	128	185	185	170	165	100
% yoy	211%	-58%	45%	0%	-8%	-3%	
Thermal	125	69	80	88	85	80	65
% yoy	125%	-45%	16%	17%	-3%	-6%	

Source: TEX, Platt's, RBS forecast

Crude oil (transport, petrochemicals)

- We characterise today's crude oil market as one that is waiting for reality to catch up with price. At US$80/bbl the oil market had fully priced in a solid economic recovery. But, as it has become clear that the effects of the great de-leveraging of 2008/09 will extend into 2010, the prompt price of oil has been under increasing pressure.
- The lesson from 2007 is that the crude oil market will not tolerate pricing which leads to cancellations of non-OPEC projects. But, if $70 to $80 oil appears sufficient to keep mega projects on track, the near term outlook for crude oil does not appear to have dramatic upside potential.
- Inventories remain a bearish weight on the front of the market, OPEC commentary is dovish, and the market will need to see an increased "Call on OPEC" to break through $80/bbl, which we do not expect until H2 10. Longer term the upturn in the business cycle should drive a recovery in demand, pushing prices back towards $100/bbl by 2013.

RBS crude oil price forecasts

US$/bbl	Current	2008	2009F	2010F	2011F	2012F	2013F
WTI	**67**	99.75	61	82	85	90	100
% yoy		38%	-39%	34%	4%	6%	11%
Brent	**66**	98.52	63	80	86	91	101
% yoy		36%	-37%	27%	8%	6%	11%

Source: Bloomberg, RBS Sempra forecasts

Iron ore (raw material for steel production)

- It now looks as if China will produce 560-575mt of crude steel in 2009, 100mt or 25% more than early estimates. Installed Chinese steel capacity has risen from ~600mtpa to over 700mtpa, leaving the iron ore market stretched to meet 2010 requirements.
- We believe that Chinese domestic iron ore production will rise to meet some of this demand but pressure on seaborne supply will build, in line with a broader improvement in steel demand outside China.
- On the back of higher spot prices and an improvement in steel production we have raised our forecast of the 2010 iron ore price hike from 10% to 20%. We believe that current contract negotiations will be more protracted than in 2009, with Asia resigned to a price increase, Europe wanting a decrease and all likely to argue about an evolving pricing structure and the BHP Rio Tinto joint venture.

RBS iron ore price forecasts

US¢/dltu	2008	2009F	2010F	2011F	2012F	2013F	LT
Fines	147	99	118	130	117	100	86
% yoy	80%	-33%	20%	10%	-10%	-15%	
Lump	205	114	137	150	135	115	102
% yoy	97%	-44%	20%	10%	-10%	-15%	

Source: TEX, Platt's, RBS forecast

US natural gas (heating, power generation)

- The prompt US natural gas price put in a major low of $2.5/MMBtu in September. Despite rallying over 100%, the market has hardly been bullish. Low spot prices in 2009 have been a reflection of weak demand leading to swollen US gas inventories that remain at near record levels.
- The big question for 2010 is: how far and how fast does the new shale technology phenomenon go? The shale technology shock may offset the decline in conventional supply. However, we believe the risk is that an underlying decline in conventional production will lead to lower US production and tightening inventories in 2010.
- Prompt prices face a number of headwinds for H1 10: switch back to coal from gas in the US power stack, shale technology delivering significant additional volume, LNG import volumes increasing further. By H2 10, we expect a pick-up in industrial demand to start to erode the inventory overhang, creating firmer prompt pricing.

RBS US natural gas price forecast – prompt NYMEX/Henry Hub

$/MMBtu	Current	2008	2009F	2010F	2011F	2012F	2013F
H-Hub	4.80	8.90	4.25	6.25	6.50	6.75	7.00
% yoy		25%	-52%	47%	4%	4%	4%

Source: Bloomberg, RBS Sempra forecasts

Commodity positioning

The table below shows our commodity preferences over two time frames. The first is a year ahead. We have taken the average spot price in December to date and compared it with our price forecast averages for the final quarter of 2010. On this analysis, we are from current levels most bullish on natural gas (+34%), palladium (+13%), oil (+8%) and aluminium (+8%). Our least favoured are gold (-14%); zinc (-14%) and nickel (-7%).

However, the rankings change if we view current prices in relation to our H213 expectations for deep inventory-draining deficits to have emerged, the world economy to be fully back into its stride and commodities in general to be in effervescent mood. Our top picks on a four-year view are palladium (+80%), aluminium (51%), nickel (48%), platinum (45%) and copper (44%).

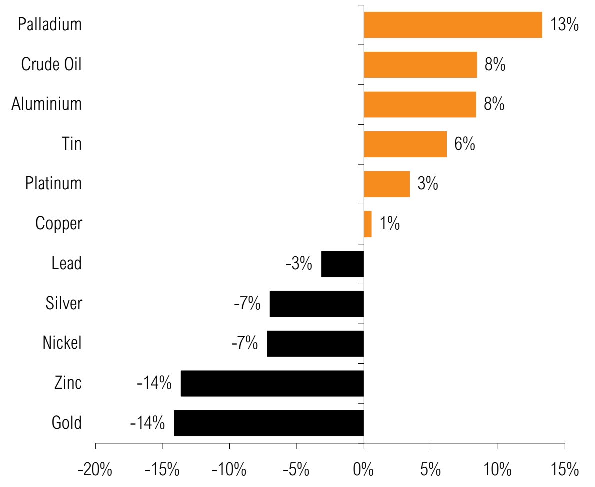
Ranked forecast price moves for key exchange traded commodities from December average price levels to the RBS forecasts 1 and 4 years ahead

		Dec 09 avg*	Q410F avg	% change	H213F avg	% change
Industrial						
Aluminium	US$/t	2,122	2,300	8%	3,200	51%
Nickel	US$/t	16,171	15,000	**-7%**	24,000	48%
Copper	US$/t	6,959	7,000	1%	10,000	44%
Lead	US$/t	2,324	2,250	**-3%**	3,200	38%
Tin	US$/t	15,064	16,000	6%	20,000	33%
Zinc	US$/t	2,317	2,000	**-14%**	3,000	29%
Precious						
Palladium	US$/oz	375	425	13%	675	80%
Platinum	US$/oz	1,450	1,500	3%	2,100	45%
Silver	US$/oz	18.29	17.00	**-7%**	23.00	26%
Gold	US$/oz	1,165	1,000	**-14%**	1,350	16%
Oil & Gas						
H-Hub Natgas	US$/MMBtu	4.86	6.50	34%	7.00	44%
Brent Crude Oil	US$/bbl	76	82	8%	100	32%

Source: LME, LBMA; Bloomberg, RBS forecasts

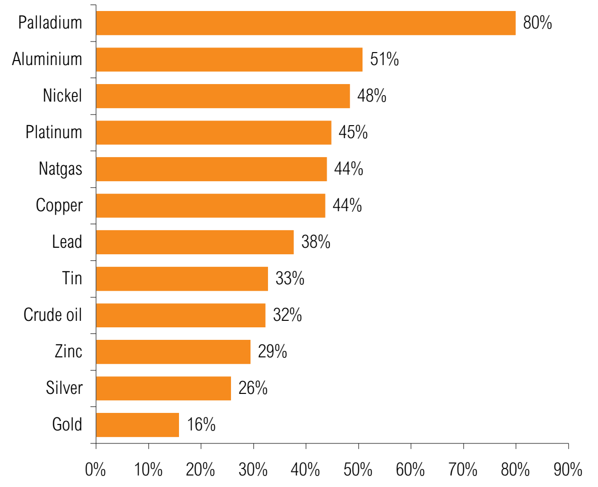
* Average to 14 December

One-year preferences – forecasts move from Dec ’09 average spot prices to RBS Q4 10F average forecasts



Source: RBS

Four-year preferences – forecast move from Dec ’09 average spot prices to RBS H213F average forecasts



Source: RBS

Commodities

Headwinds

"Exit too soon, and you will kill the recovery. Exit too late, and you sow the seeds for the next crisis. We recommend erring on the side of caution, as exiting too early is costlier than exiting too late." **Dominique Strauss-Kahn, IMF**

2010 is the year of the Tiger, but also of exit and unwind strategies

Commodities have this past decade become a mainstream asset class for investors

So it's farewell, adieu and arrivederci to the Noughties and time to welcome in the 2010s. But what a decade this has turned out to be for commodities – a decade in which commodities went mainstream as an investment class. The new millennium began with commodities on the back foot. New World technology was the hot new theme, while commodities and mining were very much Old World, the pariahs of the investment world. Investing in commodities was viewed by investment managers as being high risk, too edgy and for consenting adults only. Commodities came with a wealth warning and the joke was always "How do you make a small fortune in commodities? Invest a large one."

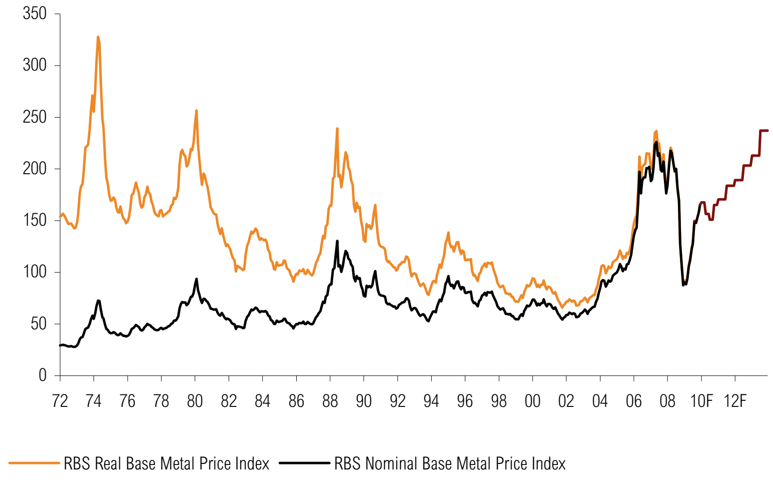
Commodities in 2009 performed the feats of a lion in the guise of a lamb; physically backed precious ETFs a new vehicle and end this decade valued at over US$70bn

But commodities in 2009 performed the 'feats of a lion in the guise of a lamb'. Since end-2008, the RBS Base Metal Price Index has risen over 80% and the CRB commodity index by over 30%, crowning the decade with one of the best years ever for commodities. The decade has seen the triumphant rise and establishment of China as the key determinant in most commodity markets. During the decade, many commodities from base, precious, oil and even the usually staid bulk commodities witnessed record highs in nominal and in many cases real terms. The decade began with not one listed physically backed precious metal Exchange Traded Fund and is ending with at least 16 precious metal exchange-listed ETFs worth a staggering US$70bn.

Central banks face a delicate balancing act in 2010 as they begin to unwind financial stimulus packages

The quote from Dominique Strauss-Kahn, Head of the International Monetary Fund, highlights the delicate balancing act that central banks around the world face in 2010. Commodity markets have benefited hugely in 2009 from the myriad government financial stimulus packages. So too have they benefited from the largesse of China, which this year embarked upon its biggest-ever commodity stockpiling spree. The theme of this *Commodity Companion* – Headwinds – focuses upon the next stage in the exciting commodity story. We believe 2010 will be all about the economic macro delivering, the unwinding and exit strategies of stimulus packages and the unwind of commodity specific stimuli.

RBS Base Metal Price Index at its highest level in 15 months and up 90% from its December 08 low. V-shaped recovery is fact, not conjecture



Source: LME and RBS

This economic recession has been the worst since 1945, but we have had a telescoped commodity cycle – peak to trough in nine months against an average of 41 months for previous price recessions, and trough halfway back to peak levels in just nine months

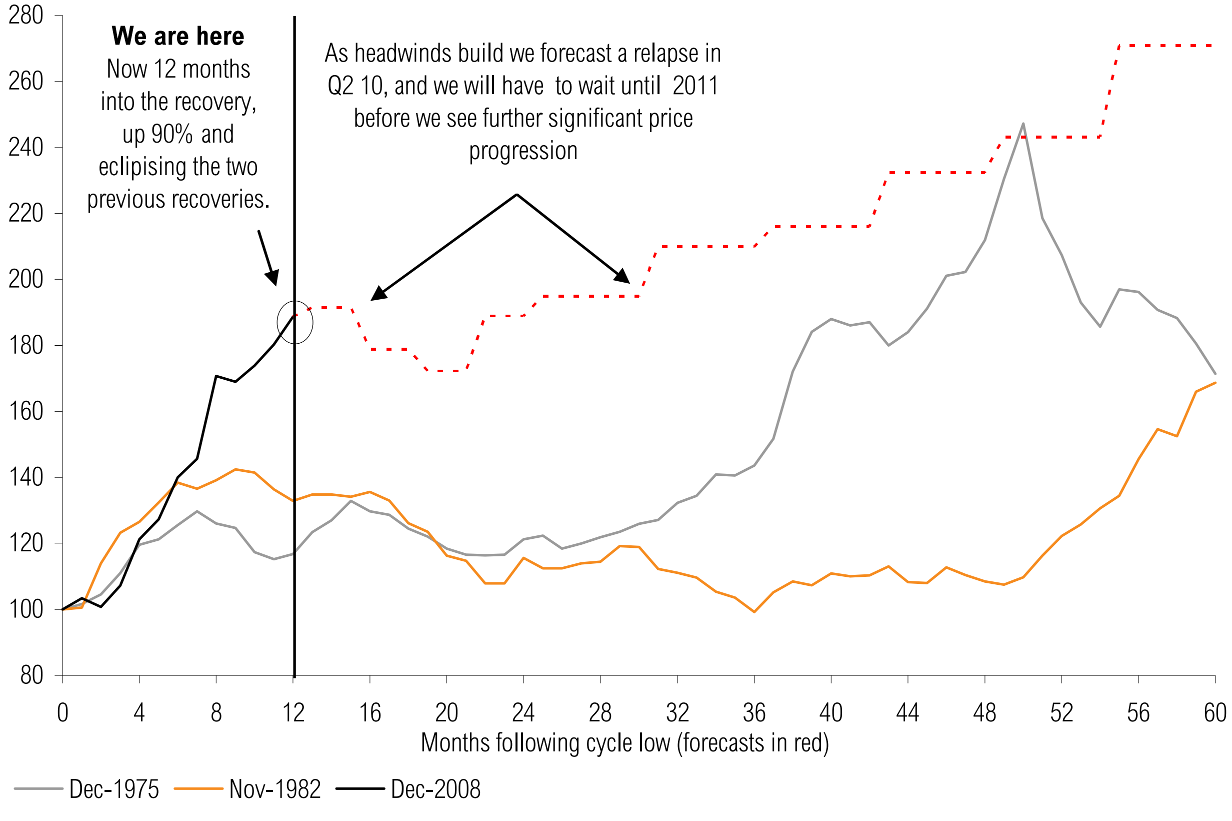
History warns us to expect a relapse in commodity prices

Despite massive supply surpluses and hundreds of thousands of tonnes of excess inventory overhanging the markets, base metals prices across the board have had an excellent 2009. Much of this has been courtesy of fund buying, not real demand pull. Chinese stockpiling and imports have acted as quasi demand, and producers have by and large kept curtailed capacity idled. Thus there has been a positive skew away from supply. This is all about to change, in our view.

History can be a useful guide to the future. The chart below shows the monthly progression of the RBS Base Metal Price Index from its lows in the two previous oil-shock-inspired declines of the mid-1970s and the early 1980s. First, all three price cycles bottomed at year-end – the final capitulation and perhaps clearing of the decks before the New Year began. Despite the worldwide economic crisis, the recovery in base metal prices as represented by the RBS Index has been eerily similar to the two previous examples. The rally of 1975 **peaked after seven months**, up 30%, and then began a meandering relapse. The rally of 1982 **peaked after nine months**, up 42%, and then relapsed for 27 months. This cycle bottomed in December 2008, has tracked the previous recoveries and outpaced them in rising 90% and **lasting 12 months**, but also seems to be running out of momentum. The common themes here are the fear and actuality of price-induced production reactivation and the handing over of the baton, from hope of economic recovery to the reality of the cycle.

The profile of the RBS Base Metal Index that drops out from our individual price forecasts nicely mirrors the price relapse of the previous price cycles. The difference this time around is China and the intensity of the financial investor. For example, Chinese metal consumption in 1975 and 1982 was negligible at less than 5% of world demand. Now it is up to 40%.

Overlapped chart of the RBS Base Metal Price Index progression in months from the cycle lows of 1975, 1982 and 2008. Strong fit – we expect a modest relapse in 2010 before sunny uplands return in 2011 and beyond



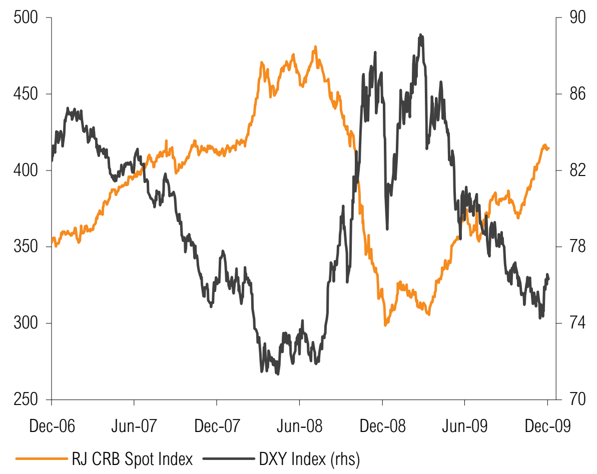
Source: LME, RBS

Sated risk appetite and a stronger US dollar are fresh headwinds

As 2010 gets under way, we must consider two potential headwinds. The first is the path of the US dollar. Commodities are priced in US dollars, so as a rule, the weaker the US dollar, the better it is for purchasers of commodities in stronger currencies such as euro or yen. The trade-weighted US dollar hit its high of this year in March at 89.6 before tumbling 17% to its low in November of 74.1. The left-hand chart shows the broad-based Reuters/Jefferies CRB commodity index against the trade-weighted US dollar and shows the strong inverse relationship. Our currency strategists forecast the EUR/USD will peak at 1.55 in Q1 10, then decline by 13% to 1.35 by Q1 11. That's a currency headwind.

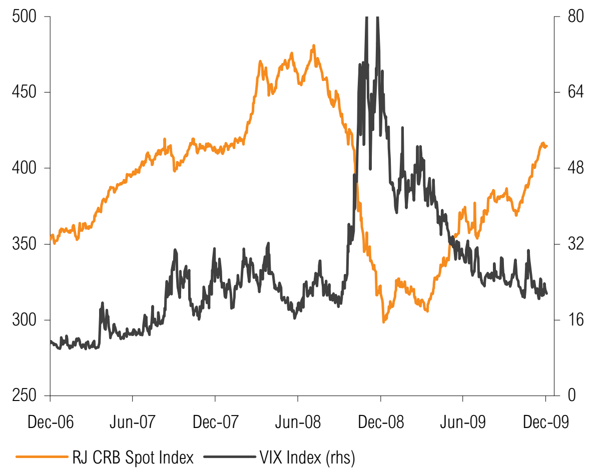
The right-hand chart shows a measure of investor appetite for risk, the S&P 500 volatility or VIX index. As the chart shows, until mid-2008, the RJ/CRB index was able to cruise higher, with the VIX index range trading and showing no signs of what was about to befall markets. As the financial crisis erupted, the VIX ballooned to record levels and the market sold risk and commodities were prime candidates for selling. This year has seen the VIX index subside to the low 20s at levels associated with pre-Lehman days and commodities have rebounded as investors have been happy to take on board the risk trade.

Reuters/Jefferies CRB commodity index vs the trade-weighted US dollar Index



Source: Bloomberg, RBS

Reuters/Jefferies CRB index vs the S&P 500 VIX volatility Index



Source: Bloomberg, RBS

Mission accomplished for the temporary bridges now the headwinds of their unwind and dismantling

Our April *Commodity Companion – Bridge over troubled water* identified four key supportive bridges across the recession that would provide solace to the commodity sector while it waited for the genuine recovery in world demand. Each of these has been successful and all are now being unwound. As a reminder, we identified the following.

Bridge 1: Global monetary and fiscal stimulus, zero interest rate policies and quantitative easing. Rates have now bottomed and some peripheral central banks have begun raising rates. Unwind of QE and rescue packages under way.

Bridge 2: Massive supply cutbacks. Reactivation is now under way, notably in aluminium, but other metals show fraying of curtailment commitment. Our preference has been for producers to wait and deploy demand-induced reactivation. However, so strong are prices that price-induced reactivation looks more likely and this could be a risk if real demand has not become robust.

Bridge 3: Chinese stockpiling. Has been substantial in 2009, but the past few months have shown significant reduction in commodity imports into China across the commodity spectrum. Our view is that Chinese stockpiling was in part to sterilise some of its over US$2trn of US dollar reserves and to buy bargain-basement-priced commodities. Crucially, access to raw materials must not be an impediment to Chinese economic growth. This is why China has been seeking ownership of commodities. If company equity ownership is blocked, then China will likely seek access to operating projects.

Bridge 4: 'Cash for clunkers'. Schemes were put in place by various governments and auto registrations have soared. Germany and the US have now closed their schemes; others, such as the UK, are close to reaching funding limits. The market does fret that the schemes have merely brought forward purchases and that auto sales will swoon in 2010.

Keep an eye on important headwinds yet to come

Watch out for a number of economic and financial headwinds that we expect to come into play in 2010 and beyond

We see many events about to occur that will likely prove to be headwinds to commodity price progression in 2010 and beyond. These events all crimp and reduce the amount of disposable income that the all-important consumer can deploy. In no particular order, our top 10 are as follows.

1) Higher taxes around the world to help pay for the financial crisis. We would now include in this one-off taxes on bank bonus pools.

2) The spectre of long-term unemployment burden with still rising unemployment numbers. This is in part a demographic issue and one of ageing populations.

3) Reduced leverage and commodity exposure by financial institutions. Already funds have been reducing their length in commodities to capture the gains of 2009 and prepare to be more selective in 2010.

4) Massive cuts in government capital-spending programmes. Governments have built up huge budget deficits associated with bank bailouts and shoring up the financial system. Cuts in spending are already being widely touted and will likely impact commodity intensive infrastructure projects.

5) Rising world interest rates as inflation becomes an issue. We expect policy rates to remain accommodative during 2010, but to be on the rise. The fed funds rate could rise to 3% by end-2010 and 5% by end-2011, while RBS forecasts the ECB will be on hold during 2010, but to have raised rates to 2.25% by end-2011.

6) Removal in the US of real estate US$8,000 housing tax credits for first-time buyers. This has been a strongly supportive measure, creating a spike in US mortgage demand over the summer when it was announced and its plunge when it was set to expire. The US$8,000 credit has now been extended to end on 30 April 2010 and a US$6,500 provision added for move-up buyers.

7) US dollar weakness ends. Our currency strategists see tail risks of a further US dollar collapse as limited by stronger US economic data, with the end game for generalised USD weakness becoming more apparent. We see the EUR/USD peaking in Q1 10 in the mid-1.50s, then appreciating by 13% to 1.35 by Q1 11.

8) Increase in resource company capital expenditure programmes as they dash for volume expansion via internal organic growth. Projects fast tracked.

9) Holdings in the physically backed exchange-listed ETFs are at record levels and could encounter selling as precious metal price progression stalls.

10) China reduces imports and offloads some of its stockpile holdings onto world markets. This is most worrying for the nickel and zinc markets.

Whilst we as commodity strategists can highlight some of the macro headwinds outside of the direct sphere of commodities, delving into the detail is a job for a professional. Opposite **David Simmonds – Head of RBS Research and Strategy**, highlights a few of the key macro headwinds for 2010 and beyond.

Macro headwinds to watch out for in 2010

David Simmonds, Head of RBS Research & Strategy

Notable in 2009 has been the extent to which a very highly correlated cross-asset class world has reduced discussion of all asset classes to a binary, global, ‘risk on’ or ‘risk off’ view.

Pulling hard in the risk positive direction is evidence of policy medicine working

Pulling hard in the risk positive direction is evidence of policy medicine working: in jump starting global trade; in unleashing powerful trade multipliers; in boosting manufacturing confidence and the rebuilding of inventory; and in raising optimism that this all leads eventually to renewed private capital spending and to new hiring. Critical throughout has been confidence that super-accommodative monetary policy will be removed only very slowly because inflation pressures remain benign and as the Bernanke-led US Federal Reserve ‘makes sure’ Japan-style deflationary debt traps are avoided.

The multiyear period of pass-the-leverage-parcel must end with government because there is no one else left to pass it to

At the more negative extreme lurks a conviction, difficult to shake, that a debt-fuelled overconsumption problem cannot ultimately be treated with more debt to fuel consumption. The multiyear period of pass-the-leverage-parcel must end with government because there is no one else left to pass it to. Meanwhile, bloated central bank balance sheets have blurred the lines between what is fiscal financing and what is monetary policy. This is all ultimately a herculean gamble that the policy stimulus ‘rocket burn’ gives economies enough altitude for them to be able to fly themselves.

Into H2 10 the global risk picture may darken

Early 2010 could be a continued ‘sweet spot’ for global asset markets, with growth strong enough to avoid any concerns about double-dip recessions yet still ‘subtrend’ enough to contain any worries that monetary policy is tightened earlier than markets have yet discounted. Into H210, the global risk picture may darken, either because monetary policy normalisation looms larger (base case); or as the need for emergency policy settings for longer becomes a cause for nervousness as opposed to being a source of liquidity-fuelled market optimism (risk case).

Prominent among big picture risks for 2010 is Asian monetary policy and the perils of global RE-IMbalancing

Lurking behind the less benign story for 2010 are some big picture risks. Prominent among these is Asian monetary policy and the perils of global RE-IMbalancing. By re-pegging or heavily managing currencies against the weak US dollar, Asia is effectively ceding monetary policy independence to the US, ‘importing’ emergency US settings. That is most inappropriate, in our view: we find it unwise at best, insane at worst. We worry in particular about China in this context as reserves growth takes off into new stratospheres unknown even by that country. But the old rules of the old game, under which China’s massive surplus saving flows easily back to finance US overconsumption, hence protecting China’s exports, will no longer apply as the US savings rate rises. When the limits of fiscal dis-saving are reached and that savings rate starts to rise more quickly, the world may be surprised by how Chinese reserves first stop growing and then even start falling. All of that is possible before the end of 2010.

An important theme that may resonate more strongly is around markets refocusing on the sanctity of sovereign credits

Uncertainty around the Middle East and around the European periphery may also have a more prolonged bearing on global markets in 2010. In isolation, neither the debt problems in Dubai nor Greece are big enough to influence directly global growth expectations. But an important theme that may resonate more strongly is around markets refocusing on the sanctity of sovereign credits, explicit and/or quasi. As mentioned, markets have hitherto viewed hyperactive fiscal loosening and much bigger budget deficits for very many countries as cause for recovery-related optimism. Next year may demand a more sober view around the limits of that fiscal expansionism and the legacy of the debt to be serviced and repaid.

Producers itching to press the reactivation button

Commodity prices have now risen to levels at which most producers are cash positive; cutbacks appear to be largely over; reactivation should be the next phase of the producer cycle

The days of massive and in many cases unprecedented producer cutbacks in the base metal industry are long gone, and the strong theme now is restarts. Producer action was a firm prop for prices in early 2009, but it risks becoming a headwind in 2010. Already by Q2 09, the flood of cutbacks had slowed to a mere rivulet as price stabilisation hardened into recovery, and there have been just a handful of further cuts in H2 09, increasingly outnumbered by restarts as prices escalated. Even in Q2 09 China, which had been in the forefront of the cuts, was quietly and not so quietly reactivating capacity in most base metal industries, and it has since been joined by producers elsewhere. There are big differences between the metals, but many cutbacks outside China remain in place. How these are handled may be crucial to price developments in 2010.

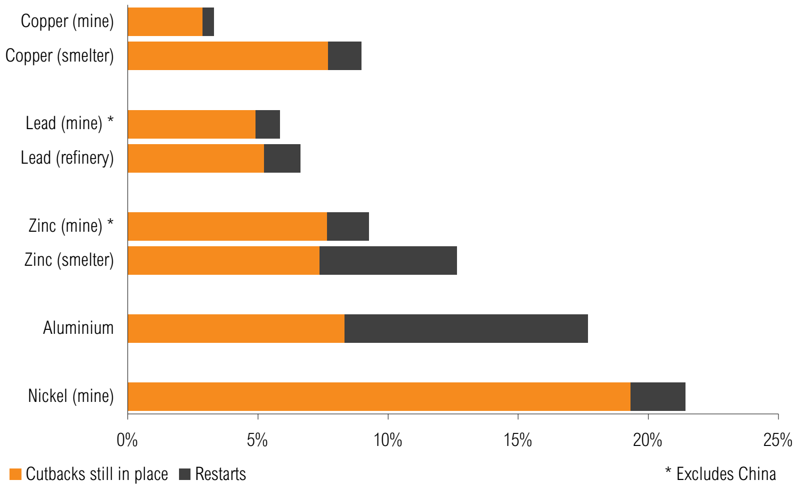
Nickel faces the biggest supply threat from reactivation. Aluminium has not blinked despite 50% of its idled capacity being restarted. Copper remains the metal with least overhang

Our chart below shows estimates of the capacity cutback since mid-2008 and the reactivation of that capacity, both expressed as a percentage of 2008 world production. Although our figures do not capture big, hard-to-monitor cuts and restarts in the Chinese lead/zinc mining industry, aluminium and nickel stand out. We estimate that the proportion of previously closed aluminium smelter capacity (over 7mtpa at its peak) that has restarted is now over 50%, the vast bulk of it in China. Our figures probably do not capture all the mines feeding the Chinese nickel pig iron industry, but the chart shows that there remains a huge overhang of idled nickel mine capacity worldwide, representing nearly 20% of 2008 world output. Triggered partly by stockpiling and reflecting priorities different from those of western companies, China dominates the list of base metal restarts.

Most capacity still idled is operated by western producers with shareholders to consider. Game theory or the prisoner's dilemma will come into play

The above means the list of cutbacks still in place is now dominated by western producers with shareholders, which are more likely to base decisions purely on market signals. But the question is, which market signal(s). On price grounds alone, almost all mines (though not custom smelters) could comfortably restart today. Yet real base metal demand globally is still quite sluggish and we expect most markets to remain in fundamental surplus in 2010. **We would therefore continue to urge producers to be cautious about embarking on price-induced restarts.** The metal most at risk is nickel, with its huge overhang of cutbacks. The aluminium market appears to have comfortably absorbed the restarts so far, but we believe caution is still warranted. The issue is scarcely relevant for copper, so small were the cuts, but the zinc market could certainly suffer if the pace of reactivation accelerates.

Producer cutbacks and restarts as a percentage of 2008 world output – restarts are mounting, stark differences between the metals



Source: Company releases and RBS

China stockpiling – from tailwind to headwind

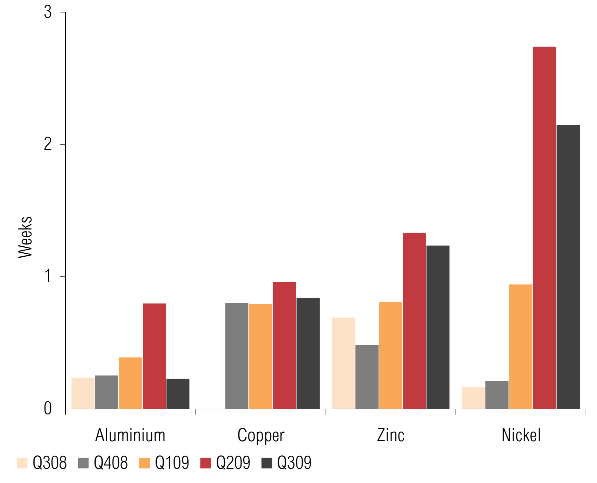
Chinese base metal imports fell sharply in Q3 09, but stockpiling continued

A central pillar of the recovery in base metal prices in 2009 has been the huge rise in Chinese imports. Refined copper imports, for example, soared to 2.75mt in Jan-Oct 2009 from 1.46mt in calendar 2008, and for some metals, shifts in trade flows have been even more dramatic. However, although real Chinese metals demand has staged a remarkable rebound since early 2009, it is widely recognised that much of the imported material has gone into stockpiles of one kind or another. Imports have, as expected, fallen sharply since Q2 09, yet we believe stockpiling continued into Q3. But it seems unlikely that it is still going on at today's prices. At the very least, then, **we expect base metal imports to be far lower in 2010, and** given that much of the stockpiling has been speculative, **material may well leak back into the market**. This represents one of the key headwinds for 2010, but varying greatly in strength from metal to metal.

Total Chinese stockpiling well over 3.5mt, but big differences between the base metals

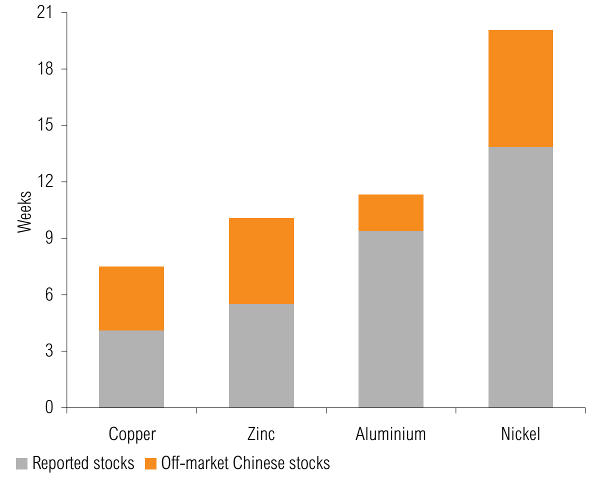
By comparing apparent Chinese demand (essentially domestic output plus net imports) with estimates of real consumption, we can derive a rough idea of the extent of stockpiling. We estimate that over the five quarters to Q3 09, China stockpiled off market well over 3.5mt of refined base metals. Tonnages range from up to 1.3mt of aluminium to about 150kt of nickel, with copper and zinc either side of 1mt and lead at least 250kt. When these figures are put in the context of market size, a very different picture emerges. The aluminium stockpile equates to barely two weeks of world demand, whereas that of nickel represents over six weeks. On this measure, the zinc stockpile is more onerous than that of copper, but both are almost as large as reported global inventories. The type of stockpiling has varied greatly, too. Nearly half the aluminium stockpile is in the relatively strong hands of China's State Reserves Bureau, which tallies well with indications that here alone, stockpiling tailed off in Q3 09. By contrast, we believe most of the nickel stockpiling has been much more speculative.

Implied build-up of off-market stocks of aluminium, copper, zinc and nickel in China (weeks of demand)



Source: CRU, Chinese General Administration of Customs, RBS

Reported world stocks and estimated off-market stocks in China, expressed in weeks of consumption



Source: CRU, Chinese General Administration of Customs, RBS

Chinese stockpiling has already more or less ceased to be a tailwind for base metals, with imports down heavily across the board in recent months. We expect it to become an outright headwind in 2010 and perhaps beyond. Imports are likely to decline further and China may even become an occasional net exporter of some metals if speculative stocks are released to the local market. Just as significant, though, are the contrasts between the metals. On almost all counts, the nickel stockpile is the most onerous and that of aluminium is the lightest burden, while the headwinds will be stronger for zinc than for copper.

RBS Commodity Checklist to Recovery

Financial signals

Resumption of more normal lending a priority and a prerequisite for a business cycle recovery	☑
Financial arteriosclerosis begins to unblock – letters of credit and resumption of lending	☑
Value investors begin to return to commodity markets/indices	☑
World equity markets find a floor and begin pricing in the business cycle recovery	☑
Commodity currencies (AUD, ZAR, CAD) come back into vogue	☑
Interbank lending rates return to 'normal' levels	☑
S&P VIX index falls back from its extreme levels (peaked at 90) to more normal levels below 30	☑
Cross-asset class selling pressure ends and funds begin to register steady positive fund inflows as risk appetite returns	☑
Major economies start phasing out nonstandard measures such as quantitative easing, reducing excess liquidity	☐
Key central bank interest rates begin to rise as headline and then core inflation data start to increase	☐

Economic signals

Pace of growth contraction stabilises	☑
Various key economy PMIs begin to rise as consumer confidence improves	☑
US ISM rebounds	☑
Key economy IP/GDP data series turn positive. Technical recession has ended in the US, Japan, Germany, France, the UK, Sweden and Brazil	☑
Automobile sales begin to recover (spurred by the various 'cash-for-clunkers' incentive schemes)	☑
Baltic Dry/Capesize Freight indices make demonstrable rises as ships begin to move cargo as international trade improves	☐
US payroll numbers finally begin to consistently improve and unemployment starts to decline	☐

Commodity market signals

Economic recession causes commodity demand to collapse. Declines yoy are severe	☑
Reported inventories rise alarmingly and stock: consumption ratios rise well away from critical/comfort levels	☑
Commodity prices slump well below marginal costs of production. Uncrowded bottom cycle trade based upon value and accumulation	☑
Metals and mining companies implement price-induced production cutbacks	☑
Miners slash exploration and capital expenditure budgets and defer/slow-track new projects	☑
Commodity price stabilisation as cutbacks bite, supply surplus contained and funds start value investing in earnest	☑
Precious metals gold, silver, platinum and palladium advance ahead of industrial and bulk commodity prices	☑
Industrial metal prices step up smartly, leaving deep lows well behind as the recovery phase of the pricing cycle occurs	☑
Better prices and improving demand outlook halts production cutback announcements	☑
Oil price recovers, spurred by OPEC constraint, and hopes that world business cycle upturn will stimulate energy usage	☑
Restocking by consumers and distributors starts to deplete the inventory pipeline	☑
Capacity reactivation accelerates, both price and demand induced	☑
Resource company capex spending reinstated as higher prices and an improving demand outlook make new projects viable	☑
Exchange inventories finally begin to erode to feed consumer restocking and nascent demand	☐
Period of onerous supply surpluses ends; market surpluses diminish and begin to switch from surplus to deficit	☐
Hiatus in price progression (relapse) while market awaits confirmation that price recovery is not a false dawn	☐
Business cycle really gets into its stride and world interest rates begin to rise to combat rising headline and core inflation	☐
Commodity markets bathed in above-trend genuine commodity demand growth.	☐
Stock: consumption ratios fall to critical levels as inventory-draining supply shortfalls occur, spurring prices even higher	☐
Momentum buyers arrive in full force, drinking from the horn of plenty. Backwardations and market squeezes reappear	☐
Bearish analysts are rarer than hen's teeth and those that survive are like Victorian children: seen but not heard.	☐
End-cycle bull market takes off. Super-cyclists return. Words like 'paradigm shift' appear again and miners declare special dividends	☐
Don't forget to book your ticket to the Bahamas!	☐

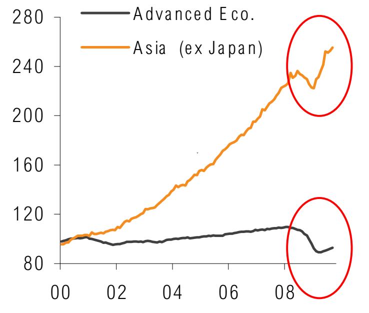
Source: RBS

RBS world GDP growth forecasts of 4.1% yoy for 2010 and 4.4% for 2011

Economic data in the western economies has show further signs of improvement, whilst Asian growth (ex Japan) has continued at an impressive pace

Since our October report, which highlighted that a number of major economies had emerged from technical recession, economic data in the western economies has show further signs of improvement, whilst Asian growth (ex Japan) has continued at an impressive pace (see chart left). Our longer-term enthusiasm towards the commodity sector derives much support from our expectation that world GDP growth will rebound to 4.1% in 2010, but base effect will of course flatter. More importantly, RBS expects this pace of expansion to continue into 2011, forecasting world GDP growth at 4.4% to provide a demand substrate.

Industrial production levels, 100 = 2000 – Asian growth continues



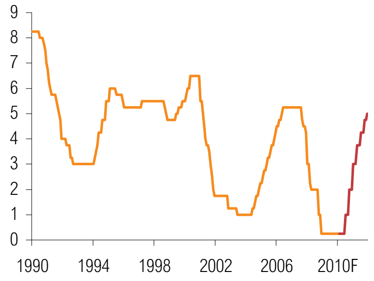
Source: RBS

RBS macroeconomic forecast summary, 2008-11F. World GDP growth in 2010 should rebound to 4.1%; strong growth should be maintained in 2011.

% change yoy	2008	2009F	2010F	2011F
Real GDP				
US	0.4	**-2.5**	3.5	4.4
Euro area	0.5	**-3.9**	1.0	1.2
Germany	1.0	**-4.8**	1.5	1.5
Japan	**-0.7**	**-5.3**	1.4	2.5
China	9.0	8.5	9.5	9.0
Asia (ex China, India)	3.1	**-0.7**	5.3	4.9
World GDP	**2.7**	**-0.6**	**4.1**	**4.4**
Industrial production				
US	**-2.2**	**-10.0**	3.0	4.5
Euro area	**-3.6**	**-13.5**	2.8	2.7
UK	**-3.1**	**-10.2**	1.0	3.4
Japan	**-3.4**	**-21.9**	14.5	3.5
Policy rate (end period)				
US	0.14	0.12	3.00	5.00
Euro area	2.50	1.00	1.00	2.25
UK	2.00	0.50	1.00	2.50
Japan	0.10	0.10	0.10	0.10

Source: RBS economic forecasts

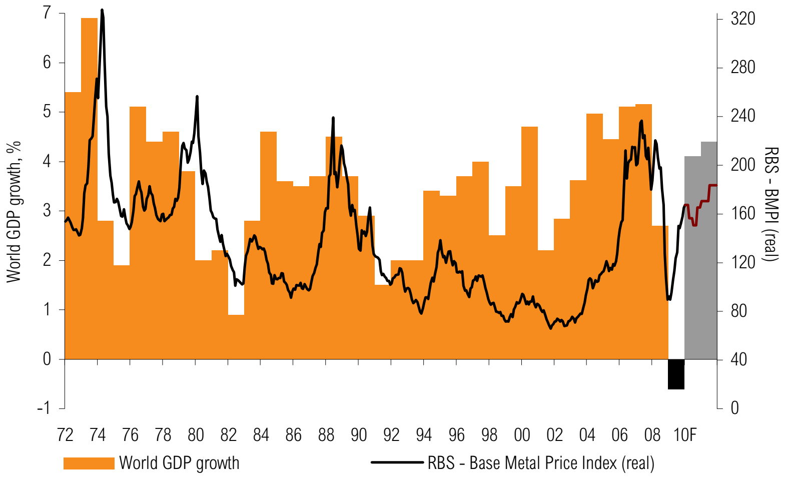
Federal funds target rate, %



Source: Bloomberg, RBS forecasts

The chart below shows the RBS Base Metal Price Index and world GDP growth. Note the powerful increases in metal prices in the period immediately following severe recession years. The difference this cycle has been that the recovery has come before a strong rebound in real growth and the magnitude of the recovery has surpassed previous cycles. History also shows us that prices tend to relapse; **we expect a more modest relapse in prices this cycle.**

World GDP growth and the RBS Base Metal Price Index in real terms. World GDP growth expected to continue into 2011

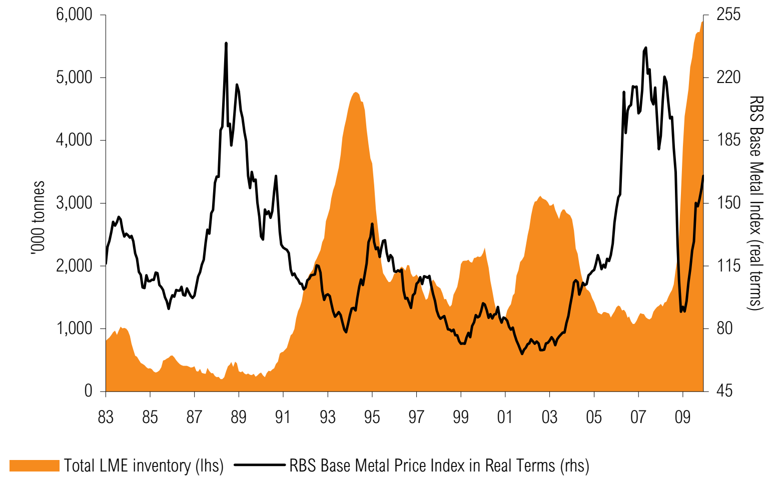


Source: IMF, LME and RBS economic forecasts

LME inventories at fresh record highs

Total LME warehouse inventories at 5.91mt have now exceeded the previous record high of 4.77mt seen at the end of April 1993. Industry destocking and collapsing consumption have enabled the LME to live up to its mantra of being the market of last resort. Warehouse inventory is now valued at over US$17bn. The good news is that **the pace of inventory accretion is slowing**. Indeed, October saw the least inventory build in 20 months.

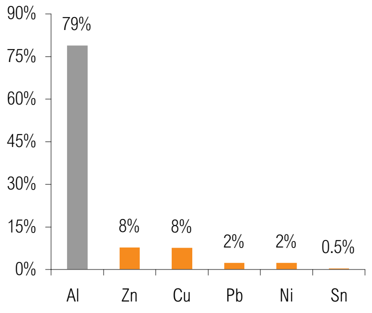
Total LME warehouse inventory is at record levels of 5.91mt – and is dominated by aluminium. Total inventory worth a record US$17bn



Source: LME and RBS

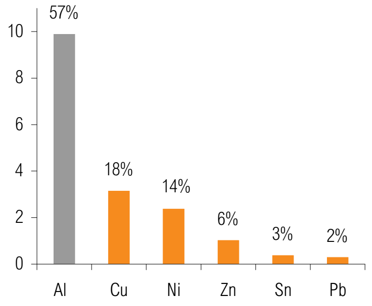
Metal held in LME-registered warehouses is dominated by aluminium holdings. Aluminium accounts for 79% of the inventory tonnage, zinc and copper 8%. In terms of inventory value, aluminium is 57%, copper 18% and nickel 14%.

Aluminium is 79% of total LME inventory and copper just 8%



Source: LME, RBS

But by value, aluminium is 57%, with copper 18% (US$bn)



Source: LME, RBS

Contraction in world supply and demand in 2009 – shared pain, shared gain as producers rapidly implemented closures; watch out now for across-the-board reactivation in 2010 and beyond

Base metal refined production and consumption should rise in 2010F

Base metal refined production and consumption contracted across the board in 2009. With respect to demand, zinc falling 8.5% and aluminium falling 8.0% yoy were the biggest casualties. For production, stainless steel down 8% and aluminium down 6.5% felt the hardest impact. For much of the commodity boom, we had price- and demand-induced capacity expansion and price-induced demand destruction. The welcome phase of price-induced production cuts and the concept of idling swing capacity also appear to be ending. The theme now is about reactivation and first-mover advantage. We forecast that all metals will show yoy production expansion in 2010, with nickel and stainless steel showing the greatest rises. This should be but the first year of significant production additions from reactivated as well as new and expanded operations.

Base metal annual yoy refined metal production growth, 2006-13F (%)

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	5.9%	12.5%	5.2%	**-6.5%**	4.0%	5.8%	6.7%	6.0%
Copper	4.2%	4.3%	0.9%	**-3.0%**	2.0%	5.0%	4.8%	3.8%
Nickel	5.1%	6.4%	**-3.3%**	**-4.3%**	7.0%	7.0%	5.5%	5.0%
Stainless steel	14.4%	**-0.5%**	**-6.4%**	**-8.0%**	9.0%	10.0%	8.5%	8.0%
Zinc	4.6%	7.1%	2.3%	**-4.4%**	4.5%	2.5%	2.5%	4.0%
Lead	3.5%	2.4%	6.3%	**-1.7%**	3.5%	3.5%	4.0%	5.0%

Source: CRU, RBS forecasts

Our estimates of metal consumption post 2009 have remained robust. We still expect the economically geared metals aluminium and nickel to register the strongest growth at 10% pa in 2010 and well above-trend growth in 2010-13. Note that nickel's strong 2009 demand showing by contracting only 2% owes much to the strength in Chinese apparent nickel demand. We also envisage a strong measure of consumer and distributor restocking in 2010-11, which would flatter the yoy numbers as well as a base effect phenomenon.

Base metal annual yoy world consumption growth, 2006-13F (%)

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	8.0%	10.0%	**-1.5%**	**-8.0%**	10.0%	8.0%	8.0%	7.0%
Copper	3.2%	3.8%	**-1.7%**	**-6.0%**	6.3%	7.0%	5.0%	5.0%
Nickel	12.2%	**-4.6%**	**-5.0%**	**-2.0%**	10.0%	8.0%	9.5%	7.0%
Zinc	5.1%	2.0%	**-0.7%**	**-8.5%**	8.8%	6.5%	6.5%	5.0%
Lead	4.1%	1.4%	4.0%	**-3.5%**	5.5%	5.0%	5.5%	4.7%

Source: CRU and RBS forecasts

Supply surpluses for at least another year; all in deficit in 2012-13F

We see hefty supply surpluses in 2008-10, but 2011 should see transition towards the first supply deficits, notably copper and lead. By 2012 all markets should be in deficit

The following tables provide summaries of our implied supply/demand market balances through to 2013F and the derived stock consumption ratios. We highlight periods of supply deficit in bold. The world supply deficits of 2006 were progressively replaced in 2007-09 by supply surpluses. We can't even begin to think what state the industry would be in had aggressive cutbacks not been made. We forecast that 2011 will be a transition year to the better, with supply surpluses diminishing and shortfalls reappearing. By 2012-13, all the metals should be in price-supporting supply deficit.

Implied world base metal supply/demand balances, 2006-13F. Supply deficits in 2010, much reduced on 2009

000 tonnes	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	**-600**	150	2,700	3,000	1,000	250	**-250**	**-750**
Copper	**-150**	**-80**	380	900	200	**-100**	**-150**	**-350**
Nickel	**-60**	90	110	75	45	35	**-25**	**-50**
Zinc	**-390**	145	480	900	500	100	**-350**	**-500**
Lead	**-140**	**-65**	115	250	100	**-50**	**-200**	**-200**

Source: CRU and RBS forecasts

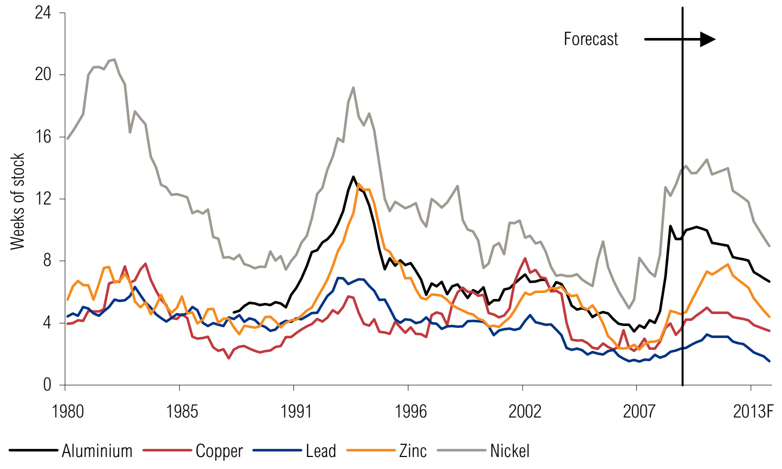
The table and chart below shows total industry inventories expressed in terms of weeks of consumption. The stock ratio rose sharply in 2008, notably for aluminium and nickel, the two more economically geared metals, and we forecast that the stock ratios will peak by the end of 2010. Based on our demand forecasts for 2010, in the case of aluminium, one week of stock equates to 0.730mt, for copper 0.340mt, for zinc 0.215mt and nickel 0.026mt.

Base metal market stock consumption ratios, 2006-13F (weeks of stock). Peak ratio shown in red. All well above critical levels – lead is tightest

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	4.0	3.8	6.3	10.0	10.0	9.0	8.0	6.5
Copper	3.4	2.9	3.4	4.2	5.0	4.7	4.2	3.5
Nickel	5.7	7.8	10.4	14.0	15.0	14.0	11.5	8.5
Zinc	2.6	2.9	3.8	5.6	7.7	8.0	6.5	4.7
Lead	1.7	1.7	1.9	2.5	3.3	3.0	2.5	1.5

Source: LME, ICSG, ILZSG, ICSG, IAI and RBS estimates and forecasts

Quarterly base metal market stock consumption ratios, 1980-2013F



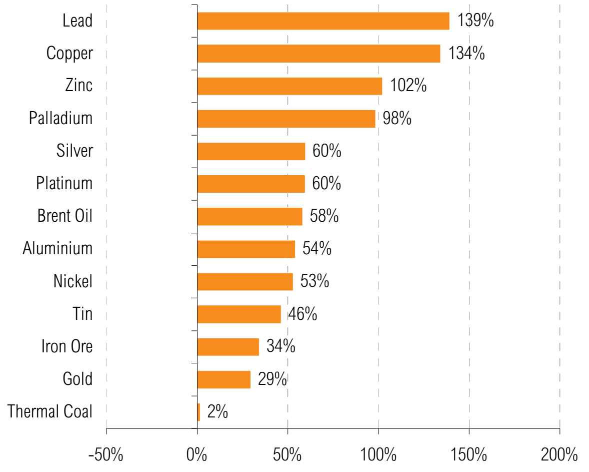
Source: RBS

Weaker US dollar has been dramatic upon commodity prices

One of the strongest drivers of commodity prices in 2009 was the weakness of the US dollar. Peaking in March at nearly 90, the trade-weighted US dollar ends 2009 down 15% at 76.5. The two charts below show the impact of the weaker US dollar on a suite of spot commodity prices. We have chosen the Australian dollar as our example, but a similar though less extreme picture emerges for the South African rand and Canadian dollars. Thermal coal up 2% in US dollar terms translates into a 22% decline in the markedly stronger Australian dollar.

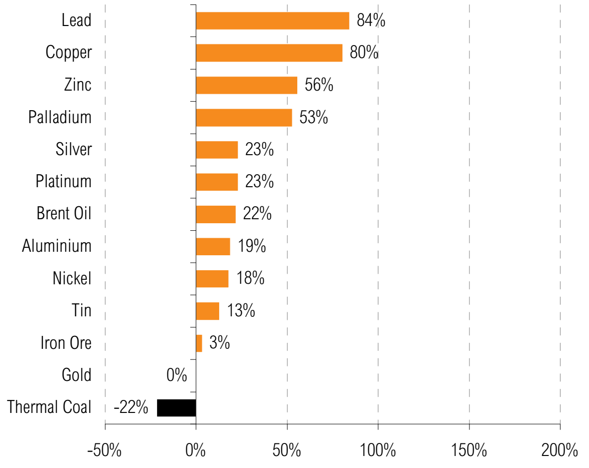
The charts show that the percentage gains in commodity prices when translated into local currency terms are dramatically lower. Miners with costs in appreciating commodity currencies but product revenues in weaker US dollars face a tough margin squeeze. Our forecasts of the US dollar reaching a tipping point pivot in Q1 10 and beginning to strengthen would provide much needed alleviation to hitherto strong currency located producers.

Gains in our commodity suite since end-2008 in US dollars have been eye-catching...



Source: Bloomberg and RBS

… but in stronger Australian dollar, the gains are lower and indeed, some gains have turned to losses



Source: Bloomberg and RBS

Transitioning from recovery to expansion phase

If 2009 was all about second guessing the V-shaped recovery, 2010 is all about the delivery of the economic recovery; world GDP must make a smooth transition to expansion; meanwhile, commodity producers will be eager to reactivate capacity and the Chinese may well stockpile far less metal, indeed even begin to sell and export again

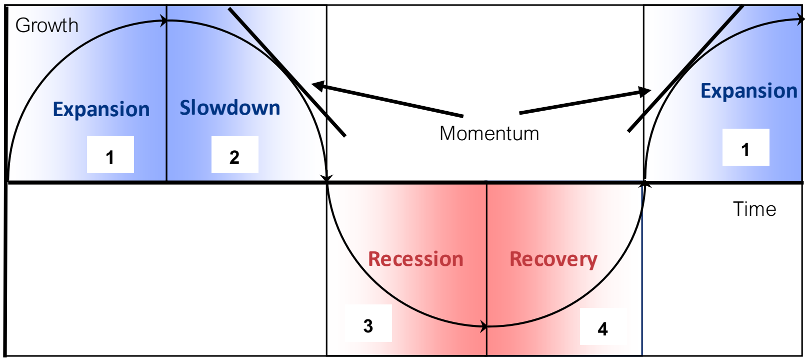
As 2009 draws to a close, we remain confident that world GDP in 2010 and 2011 will enjoy markedly better growth. We do not foresee a double-dip. The RBS view is for growth of over 4% pa in both 2010 and 2011. This means that we can say that the demand substrate for commodities is about to get a whole lot better. Bargain-basement commodity prices are now a rapidly fading memory. That was the Q4 08 and Q1 09 **bottom-of-the-cycle trade.** That was certainly not a crowded trade, but how sobering to think that the biggest players of this trade were the Chinese attracted by **value** and the **opportunity to accumulate** exposure. The year 2009 was all about following the risk trade rather than the economic trade. In our opinion, 2010 will be less about risk and more about economics, recovery and expansion. Commodity markets are now entering a sort of **twilight zone,** where the baton has to be successfully handed over to genuine economic demand pull as the business cycle recovers. This trade is more about **momentum and value stretch** and is a much more crowded trade.

Recovery Phase 4 of the business cycle transitioning to Expansion Phase 1

As we leave 2009 behind, we leave a year that began with prices at levels that were deep into industry cost curves and which saw huge swathes of the industry losing money. But recession now appears to be over in the key developed world economies and the temporary bridges to stimulate growth are being unwound. Commodities are **now all about the macro.**

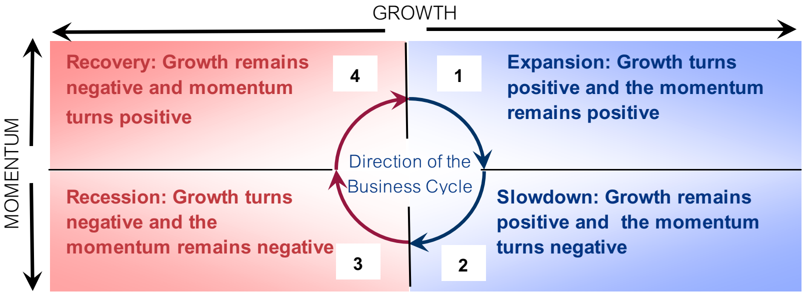
So where are we in the business cycle? The two diagrams below are from the **RBS Business Cycle Screener** published by our colleagues in European Economics. Investors in commodities in 2009 have been discounting that the world business cycle is moving from Recession Red Phase 3 into Recovery Red Phase 4 and that 2010 is all about the business cycle moving into Expansion Blue Phase 1, when growth and momentum turn positive.

The four phases of a typical business cycle. Many economies have now declared the technical recession over. Now in Phase 4 – Recovery



Source: RBS

RBS Business Cycle Screener: Dynamics of the four different phases of a typical business driven by Growth and Momentum



Recovery: Growth remains negative and momentum turns positive

Expansion: Growth turns positive and the momentum remains positive

Recession: Growth turns negative and the momentum remains negative

Slowdown: Growth remains positive and the momentum turns negative

Source: RBS

Crucially, although the phases of this cycle have been pretty much textbook, the speed at which the slowdown and recession phases have completed their moves has been swift. Historically, base metal prices as represented by the RBS Base Metal Price Index have taken 41 months to move from peak to trough. **This time around, that journey was achieved in just nine months, from March to December 2008 – a telescoped cycle.**

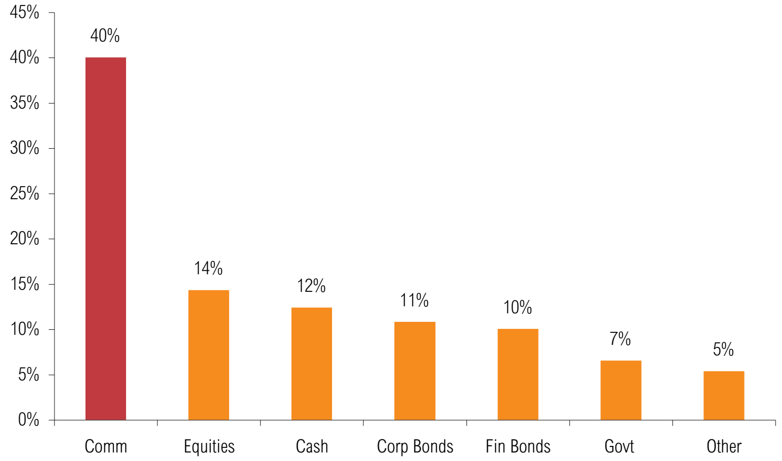
Andy Chaytor, RBS Macro Strategy Unit, received 320 responses from clients around the world to our November poll, which asked them what asset class they would invest US$100 for 2010; the answer was startlingly in favour of commodities at 40%

What are YOU thinking? – RBS Investor Poll shows acute investor Interest in commodities

Acute investor interest has been a key driver of the impressive gains across the commodity complex in 2009 despite, or perhaps because, many of the commodities – such as copper, crude oil and of course the precious metals – have set the heather afire with their price performance. The **Quarterly RBS Investor Poll** taken in November highlighted that investor interest in commodities remains as strong as ever.

RBS had 320 responses to its November poll, in which one of the questions to both real money and leveraged clients was "**What would you spend $100 on in 2010?"** The chart below shows the overwhelming response was to our very own sector, **with 40% of respondents favouring commodities. Given that there were seven potential asset pots from which to choose, this was a significant consensus and much bigger than anything we have seen in previous RBS polls.** The next most popular asset class was equities, with only about 15%.

RBS cross-asset November poll – despite impressive gains in 2009, investor interest in commodities remains as strong as ever



Source: RBS

In conclusion, after an excellent year for most commodities, we believe that a number of exogenous macro and commodity-specific headwinds are building in 2010. We think that commodity prices will generally hold up well, but headwinds are likely to limit further substantial gains in prices. However, fears of renewed US dollar weakness, spiking inflation and desire for greater portfolio diversity into hard assets are likely to sustain investor interest in commodities in 2010, preventing a Q2 10 correction from becoming a rout.

It will be crucial for real demand in western developed world economies to flourish and compensate for the ending of temporary stimulus packages and Chinese stockpiling. **The path of the US dollar, attitudes to risk appetite and the macroeconomic outlook are now the three key common denominators for the commodity complex.** **Nick Moore, head of Commodity Strategy**

RBS annual commodity price actuals and forecasts, 2008-13F

		2008A	2009F	2010F	2011F	2012F	2013F	LT
Base metals								
Aluminium	US¢/lb	117	75	100	110	120	135	**110**
	US$/t	2,571	1,665	2,200	2,400	2,650	3,000	**2,425**
Copper	US¢/lb	315	233	305	340	375	430	**225**
	US$/t	6,951	5,145	6,750	7,500	8,250	9,500	**4,950**
Lead	US¢/lb	95	78	102	113	127	141	**77**
	US$/t	2,084	1,720	2,250	2,500	2,800	3,100	**1,700**
Zinc	¢/lb	85	75	90	98	111	129	**82**
	US$/t	1,870	1,650	1,975	2,150	2,450	2,850	**1,800**
Nickel	US$/lb	9.53	6.62	6.70	7.70	8.75	10.45	**6.80**
	US$/t	21,020	14,585	14,750	17,000	19,250	23,000	**15,000**
Tin	US$/lb	8.39	6.14	6.80	7.60	8.05	8.85	**6.80**
	US$/t	18,487	13,535	15,000	16,750	17,750	19,500	**15,000**
Precious metals								
Gold	US$/oz	872	975	1,000	1,075	1,200	1,300	**825**
Silver	US$/oz	14.99	14.65	17.00	17.50	20.00	22.00	**13.00**
Platinum	US$/oz	1,572	1,205	1,450	1,650	1,800	2,000	**1,400**
Palladium	US$/oz	351	265	400	450	550	650	**400**
Bulks								
Fe – fines	US¢/dltu	147	99	118	130	117	100	**86**
Fe – lump	US¢/dltu	205	114	137	150	135	115	**102**
Coal – Hard coking	US$/tonne	305	128	185	185	170	165	**100**
Coal – Semi soft coking	US$/tonne	240	79	115	110	105	89	**74**
Coal – LV PCI	US$/tonne	245	86	125	120	115	110	**80**
Coal – Thermal	US$/tonne	125	69	80	88	85	80	**65**
Oil & natural gas								
WTI Crude Oil	US$/bbl	99.75	61	82	85	90	100	**100**
Brent Crude Oil	US$/bbl	98.52	63	80	86	91	101	**101**
Henry Hub Natural gas	US$/MMBtu	8.90	4.25	6.25	6.50	6.75	7.00	**7.00**
Uranium	US$/lb	63	47	51	63	85	78	**65**

Annual yoy percentage changes in historic and RBS price forecasts, 2008-13F (not revisions to previous forecasts)

	2008A	2009F	2010F	2011F	2012F	2013F
Base metals						
Aluminium	-3%	-35%	32%	9%	10%	13%
Copper	-2%	-26%	31%	11%	10%	15%
Lead	-20%	-17%	31%	11%	12%	11%
Zinc	-42%	-12%	20%	9%	14%	16%
Nickel	-43%	-31%	1%	15%	13%	19%
Tin	27%	-27%	11%	12%	6%	10%
Precious metals						
Gold	25%	12%	3%	8%	12%	8%
Silver	12%	-2%	16%	3%	14%	10%
Platinum	21%	-23%	20%	14%	9%	11%
Palladium	-1%	-24%	51%	13%	22%	18%
Bulks						
Fe – fines	80%	-33%	20%	10%	-10%	-15%
Fe – lump	97%	-44%	20%	10%	-10%	-15%
Coal – Hard coking	211%	-58%	45%	0%	-8%	-3%
Coal – Semi soft coking	281%	-67%	46%	-4%	-5%	-15%
Coal – LV PCI	263%	-65%	45%	-4%	-4%	-4%
Coal – Thermal	125%	-45%	16%	17%	-3%	-6%
Oil & natural gas						
WTI Crude Oil	38%	-39%	34%	4%	6%	11%
Brent Crude Oil	36%	-37%	27%	8%	6%	11%
Henry Hub Natural gas	25%	-52%	47%	4%	4%	4%
Uranium		-25%	8%	22%	36%	-8%

Source: LME, LBMA, LPPM, TEX, NYMEX, RBS forecasts

RBS quarterly average commodity price forecasts, 2009-10F

		2009F					2010F				
		1QA	2QA	3QA	4QF	**2009F**	1QF	2QF	3QF	4QF	**2010F**
Base metals											
Aluminium	US¢/lb	62	67	82	91	**75**	105	100	90	105	**100**
	US$/t	1,360	1,488	1,806	2,000	**1,665**	2,300	2,200	2,000	2,300	**2,200**
Copper	US¢/lb	156	212	265	300	**233**	320	295	295	320	**305**
	US$/t	3,435	4,675	5,839	6,625	**5,145**	7,000	6,500	6,500	7,000	**6,750**
Lead	US¢/lb	53	68	87	104	**78**	107	102	98	102	**102**
	US$/t	1,159	1,505	1,924	2,285	**1,720**	2,350	2,250	2,150	2,250	**2,250**
Zinc	US¢/lb	53	67	80	99	**75**	100	86	82	91	**90**
	US$/t	1,173	1,475	1,756	2,190	**1,650**	2,200	1,900	1,800	2,000	**1,975**
Nickel	US$/lb	4.74	5.89	8.00	7.85	**6.62**	7.05	6.60	6.35	6.80	**6.70**
	US$/t	10,455	12,986	17,608	17,285	**14,585**	15,500	14,500	14,000	15,000	**14,750**
Tin	US$/lb	5.00	6.14	6.60	6.80	**6.14**	6.80	6.60	6.60	7.25	**6.80**
	US$/t	11,012	13,538	14,563	15,025	**13,535**	15,000	14,500	14,500	16,000	**15,000**
Precious metals											
Gold	US$/oz	908	922	960	1,105	**975**	1,100	950	950	1,000	**1,000**
Silver	US$/oz	12.60	13.76	14.69	17.60	**14.65**	17.50	17.00	16.50	17.00	**17.00**
Platinum	US$/oz	1,023	1,172	1,230	1,390	**1,205**	1,450	1,400	1,450	1,500	**1,450**
Palladium	US$/oz	199	234	272	348	**265**	400	375	400	425	**400**
Oil & Natgas											
WTI Crude Oil	US$/bbl	43	60	68	74	**61**	78	80	85	85	**82**
Brent Crude Oil	US$/bbl	46	60	69	76	**63**	79	79	81	81	**80**
Henry Hub Natural gas	US$/MMBtu	4.47	3.81	3.44	5.25	**4.24**	5.75	6.25	6.50	6.50	**6.25**

Half-year average price assumptions, 2009-13F

		2009F		**2010F**		**2011F**		**2012F**		**2013F**	
		1HA	**2HF**	**1HF**	**2HF**	**1HF**	**2HF**	**1HF**	**2HF**	**1HF**	**2HF**
Base metals											
Aluminium	US¢/lb	65	86	103	98	105	115	115	125	125	145
	US$/t	1,424	1,903	2,250	2,150	2,300	2,500	2,500	2,800	2,800	3,200
Copper	US¢/lb	185	283	308	308	330	350	365	385	410	455
	US$/t	4,055	6,232	6,750	6,750	7,250	7,750	8,000	8,500	9,000	10,000
Lead	US¢/lb	60	96	105	100	109	118	125	129	135	145
	US$/t	1,332	2,105	2,300	2,200	2,400	2,600	2,750	2,850	3,000	3,200
Zinc	US¢/lb	60	90	93	87	95	100	109	113	120	135
	US$/t	1,324	1,973	2,050	1,900	2,100	2,200	2,400	2,500	2,700	3,000
Nickel	US$/lb	5.30	7.93	6.80	6.60	7.25	8.15	8.40	9.05	10.00	10.90
	US$/t	11,721	17,447	15,000	14,500	16,000	18,000	18,500	20,000	22,000	24,000
Tin	US$/lb	5.55	6.70	6.70	6.90	7.50	7.70	7.95	8.15	8.60	9.05
	US$/t	12,275	14,794	14,750	15,250	16,500	17,000	17,500	18,000	19,000	20,000
Precious metals											
Gold	US$/oz	915	1,033	1,025	975	1,000	1,150	1,200	1,200	1,250	1,350
Silver	US$/oz	13.18	16.15	17.25	16.75	16.50	18.50	20.00	20.00	21.00	23.00
Platinum	US$/oz	1,098	1,310	1,425	1,475	1,600	1,700	1,750	1,850	1,900	2,100
Palladium	US$/oz	217	310	388	413	425	475	525	575	625	675

Source: LME, LBMA, LPPM, TEX, NYMEX, RBS forecasts

Revisions to RBS October 2009 forecasts

Changes in RBS commodity price forecasts since our October 2009 *Commodity Companion – boom, bust, readjust*

	2009F	2010F	2011F	2012F	2013F
Base metals					
Aluminium	1%	10%	9%	5%	4%
Copper	1%	0%	3%	0%	6%
Lead	1%	0%	4%	11%	13%
Zinc	4%	-2%	0%	2%	12%
Nickel	-1%	-5%	-3%	0%	0%
Tin	-2%	-6%	-3%	0%	8%
Precious metals					
Gold	3%	0%	10%	20%	13%
Silver	1%	-3%	9%	19%	16%
Platinum	0%	0%	6%	13%	11%
Palladium	6%	14%	13%	16%	0%
Bulks					
Fe – fines	0%	9%	12%	12%	5%
Fe – lump	0%	9%	12%	9%	3%
Coal – Hard coking	0%	23%	23%	17%	14%
Coal – Semi soft coking	0%	38%	26%	15%	6%
Coal – LV PCI	0%	28%	22%	28%	22%
Coal – Thermal	0%	7%	13%	6%	-3%
Oil & natural gas					
WTI Crude Oil	0%	6%	0%	0%	0%
Brent Crude Oil	0%	1%	-1%	-1%	0%
Henry Hub Natural gas	0%	0%	0%	0%	0%
Uranium	0%	-13%	-24%	3%	20%

Source: RBS forecasts

Economic focus

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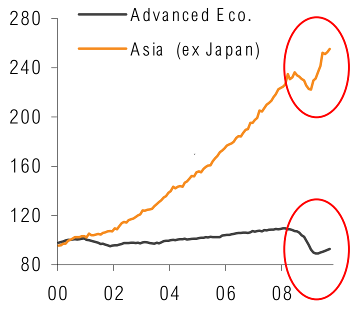
Waiting for the Asian Policy Adjustment

RBS expects global growth to bounce back to 4.1% in 2010, broadly maintaining this pace of expansion in 2011 (4.4%). We forecast global inflation will double in 2010, from 1.3% to 2.6%, edging up to 3.2% in 2011. Against the backdrop of resilient activity, we expect all major central banks to be well advanced in their normalisation process by end-2011, barring the BOJ. However, the global monetary policy stance is likely to remain very accommodative, with a global real benchmark policy rate around 1%.

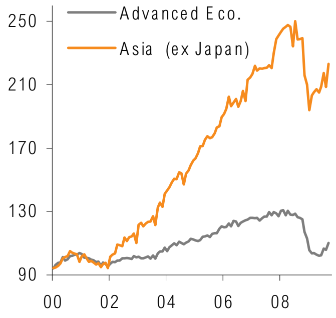
Focusing on the near-term outlook, Asian growth (excluding Japan) **continues to deliver an impressive performance** relative to Western economies. Perhaps most strikingly, industrial output – in level terms – in non-Japan Asia has not only recouped the losses post crisis, but has already reached a level in line with the pre-crisis trend (see chart below). Meanwhile, advanced economies have displayed an L-shaped profile. The fact that Asian trade has not recovered in a similar way (see chart below) suggests that a large part of the improvement in industrial trends in the region is a result of unprecendented stimuli rather than a revival in foreign demand.

1. Industrial production
levels, 100 = 2000; last obs is Sep



Source: RBS

2. World trade
levels, 100 = 2000; last obs is Sep



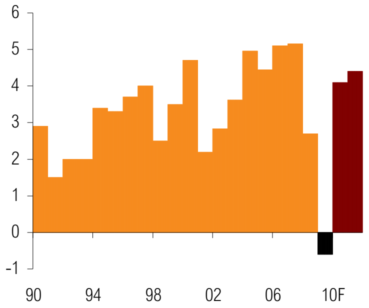
Source: RBS

Our Asian team worries most about monetary policy settings there, where maintaining heavily managed currencies against the US dollar means ceding monetary policy to the US. Inflation risks might be escalating on a combination of rising commodity prices, capital inflows and narrowing output gaps, with broad money growth already running well ahead of nominal GDP. **Those countries with the strongest links to the US dollar, including Hong Kong, may be in for a boom-bust ride.** Higher rates become self defeating when they merely fuel revaluation-seeking speculative capital inflows. Ultimately, Asia spells considerable '*re-im*balancing' risks for itself and for the global economy.

Against the backdrop of this unstable equilibrium, **we believe that sooner or later, policymakers will need to accept currency appreciation as a policy tool**, a necessary and integral part of global rebalancing. Our Chief China Economist expects CNY appreciation to resume in mid-2010 and continue through 2011, as the export sector stabilises and capital inflows continue to grow. The risk is that this gradual appreciation will spur even larger capital inflows and accentuate asset bubbles. It is thus key that policymakers take the tough decisions on economic reform and policy tightening next year, rather than wait for a recovery in export demand and US Federal Reserve rate hikes.

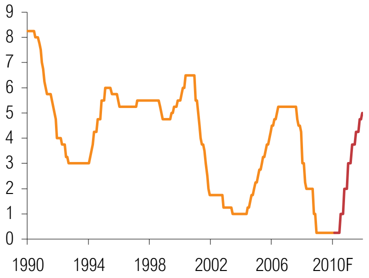
RBS economics, rates and FX forecasts

RBS world GDP growth forecast % change yoy. Rebound on its way



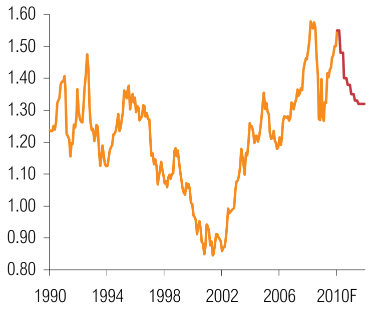
Source: IMF, RBS forecasts

Federal funds target rate % - on the increase by H2 10



Source: Bloomberg, RBS forecasts

EUR/USD – USD forecast to strenghthen in the months ahead



Source: Bloomberg, RBS forecasts

	2007	2008	2009F	2010F	2011F
Real GDP – calendar % change yoy					
US	2.8	0.4	**-2.5**	3.5	4.4
Japan	2.0	-0.7	**-5.3**	1.4	2.5
China	11.6	9.0	8.5	9.5	9.0
Euro area	3.0	0.5	**-3.9**	1.0	1.2
UK	2.9	0.6	**-4.7**	1.0	2.5
World GDP	**5.1**	**2.7**	**-0.6**	4.1	**4.4**
Industrial production – % change yoy					
US	1.3	**-2.2**	**-10.0**	3.0	4.5
Euro Area	5.0	**-3.6**	**-13.5**	2.8	2.7
UK	0.5	**-3.1**	**-10.2**	1.0	3.4
Japan	5.4	**-3.4**	**-21.9**	14.5	3.5
Consumer price inflation – headline – year-end, % change yoy					
US	3.23	3.8	**-0.3**	3.0	3.2
Japan	0.25	1.4	**-1.3**	**-1.0**	**-0.6**
China	1.47	5.9	**-0.8**	2.2	5.3
Euro area	2.18	3.3	0.3	3.0	3.2
UK	2.3	3.6	2.1	2.3	1.8
World	**3.5**	**4.6**	**1.3**	**2.6**	**3.1**
Policy rate – year-end, %					
US	5.25	0.14	0.15	3.00	5.00
Japan	0.25	0.10	0.10	0.10	0.10
Euro Area	3.50	2.50	1.00	1.00	2.25
UK	5.00	0.50	0.50	1.00	2.50

Key commodity currency – FX forecasts – end period

	Q110	Q210	Q310	Q410	Q111	Q211	Q311	Q411
Rates per US dollar								
AUD*	1.00	0.95	0.90	0.87	0.85	0.85	0.85	0.85
CAD	1.00	0.98	0.99	0.99	1.00	1.01	1.02	1.03
ZAR	8.00	7.50	7.50	7.50	7.00	7.00	7.00	7.00
CLP	480	500	510	510	510	520	520	520
CNY	6.80	6.70	6.60	6.50	6.40	6.30	6.20	6.20
INR	44	45	45	46	47	46	46	47
RUB	32.0	33.5	34.0	34.5	34.0	34.0	33.5	32.0
TRY	1.55	1.57	1.55	1.53	1.62	1.67	1.60	1.60
JPY	85	90	93	96	99	102	108	110
GBP*	1.62	1.57	1.47	1.57	1.65	1.71	1.69	1.71
Rates per euro								
USD	1.55	1.48	1.40	1.38	1.35	1.33	1.32	1.32
JPY	132	133	130	133	134	136	143	145
GBP	0.96	0.94	0.95	0.88	0.82	0.78	0.78	0.77

*Currency at head column per currency at end row

Source: RBS forecasts

US

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Productivity will not prevent hiring

Given solid GDP growth in Q3 and expectations of another significant advance in Q4, there is no longer much debate about whether the recession is over. Instead, the most important disagreement among economists has turned to whether this recovery will be jobless or not. This issue basically boils down to two questions: 1) how fast will output grow? and 2) given those output gains, will firms have the ability to increase productivity enough to achieve that output growth without adding workers? Productivity becomes a critical piece of the narrative. History teaches us a few things about the pattern of productivity gains during recoveries, but the main conclusion is that productivity gains tend to be fairly uniform across different cycles. Thus, the faster output rises, the more hiring will occur.

Three key conclusions can be based on productivity data

1. Labour hoarding no longer exists. Years ago, economics textbooks taught that businesses engaged in labour hoarding during recessions. The theory suggested that because good employees are hard to find, firms would be slow to lay off workers that they did not want to lose when conditions improved. If this theory were true, then productivity growth would be subpar during recessions because output would fall faster than hours worked. The data appears to bear out this notion for the recessions of the late 1970s, 1980s and 1990s. Productivity was stagnant (i.e., well below the secular trend) through each downturn.

The nature of the economy changed sometime between 1991 and 2001. In the 2001 recession, firms took a much tougher line toward payrolls, cutting workers more quickly and more sharply than in prior downturns. We have sometimes referred to the new reality as “just-in-time employment“. The brutal contraction in employment seen during the latest cycle attests to the absence of labour hoarding. Indeed, productivity has tracked closely to the 1999-2001 period.

2. Productivity in recoveries always looks the same. The most surprising pattern is that productivity growth seems to track pretty much the same across the past four recoveries. We find this extraordinary given the differences in the economic cycles. The 1970s and 1980s expansions occurred under the old labour hoarding model of employment and were classic V-shaped recoveries. The 1990s and early 2000s recoveries were much more tepid in terms of growth and employment, and the latter occurred under a vastly different hiring mentality.

Two important forces bear on productivity during recoveries. First, most firms enjoy economies of scale in their production process. Therefore, as demand picks up from depressed recessionary levels, firms should see their productivity accelerate. The faster growth recovers, the faster productivity should grow, all else equal, at least until the scale of operations gets back to a more normal level. A second force moves in the opposite direction. The greater the change, the more a company’s efficiency is disrupted – in particular, when output surges rapidly and firms have to scramble to add workers. Thus, the more rapid the change, the greater the temporary drag to labour productivity. The trajectory of productivity growth in the past several recoveries suggests that gains are sharpest early on and begin to moderate as the recovery transitions to mature expansion. This record indicates that economies of scale are the more powerful force in an absolute sense because productivity growth is almost always above trend in the early stages of the recession. However, the two forces may roughly counterbalance in the sense that productivity growth fails to vary much with the vigour of the recovery.

3. 1990s productivity acceleration is a special case. From 1998 through 2003, nonfarm business productivity advanced at better than a 4% clip on average, an extraordinary six-year run. Although one can certainly debate the pace of underlying productivity currently, there is no question that it is far lower today than in 2001-03. Thus, the "jobless recovery" in 2002 and 2003, when employment was stagnant despite reasonable real GDP growth, should be viewed as a special case and not as the benchmark for the current expansion. Firms will undoubtedly be very careful about hiring as the economy expands, but RBS believes that firms simply will not have as much –ability to expand production without adding workers as they did in the early 2000s. This is a key point of contention among economists (and possibly among policymakers) and will constitute a key element of the outlook in 2010.

Implications for the current recovery. The consensus view seems to be that firms have a practically inexhaustible reservoir of productivity-enhancing moves at their disposal. However, there are only so many minutes in the day and there is a limit to the productivity gains that can be achieved by making existing employees work more hours. It is also true that managers are much more conscious now than they may have been decades ago about squeezing inefficiencies out of the system. There is a finite reservoir of low-hanging improvements, and while we concede that more can be done from here, it seems doubtful that firms will be able to continue to pull rabbits out of their hats forever. Finally, adding a worker is clearly a last resort today rather than a first resort, as high fixed costs make for a hostile environment for potential hires. For all of these reasons, we believe firms will be less eager to hire in 2010 than in the 1970s and 1980s. However, in our view, the time is coming closer when firms will simply have no choice but to add to their payrolls if they want to expand to meet demand.

This is not 2002. Demand is rising faster and underlying trend productivity is advancing more slowly today than it was then. This suggests that the answer to the "Will they or won't they hire?" question is simple. The stronger the economic expansion, the faster employment will rise. Given the severity of the recession and the early signs of a healthy upturn in the second half of 2009, we feel good about our forecast of solidly above-trend growth in 2010 and thus continue to confidently predict substantial net hiring in 2010.

GDP update

Relative to roughly a month ago, our forecasts for GDP growth in the next two quarters are little changed. We pared the output gain in the third quarter from 3.5% annualised to 2.8%. Our estimates for the fourth and first quarters remain between 3.5% and 4.0%. We still look for the economy to gather speed as 2010 progresses and expect robust growth to continue into 2011.

Monetary policy

We believe that the Fed will continue to add to the size of its balance sheet by buying agencies and MBS through March 2010, but also will be readying means to drain liquidity in early 2010, most notably a reverse repo program currently being tested. We look for the Fed to begin draining liquidity in the spring of 2010. Meanwhile, given our expectations of solidly above-trend growth, including a resumption of job gains, and a gentle acceleration in core inflation, we look for the Fed to begin to normalise rates beginning in June 2010. We expect the pace of rate hikes to be more rapid than in 2004-06, not only because the economic fundamentals will dictate a relatively quick move to less accommodative policy, but also because efforts to drain liquidity from the money markets will put additional upward pressure on the fed funds rate.

Euro area

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The bumpy road ahead

Since the publication of our last *Commodity Companion*, the euro-area flash GDP estimate for Q3 was 0.4% qoq, marking the end of the deepest and longest recession in the region since WWII. Although the first positive quarterly growth rate since Q1 08 was slightly weaker than expected, the country data suggests this will be largely offset by a modest upwards revision to Q2 GDP.

Overall, we have not significantly revised our euro-area outlook. We continue to expect quarterly growth in Q4 to recover at a similar pace to Q3 and for **GDP growth to recover to 1.0% in 2010 and 1.2% in 2011, from an annual contraction of 3.9% in 2009.** Nonetheless, this would still represent below-trend growth – we continue to expect the quarterly pace of growth in H1 10 to remain subdued as some of the short-term temporary/technical drivers of growth (e.g., slower destocking, cash for clunkers) fade.

That said, the latest survey data continues to improve ahead of our expectations, with the euro-area composite PMI rising to 53.7 in November – its strongest since November 2007. We continue to judge that **risks to our macroeconomic outlook are skewed towards a slightly firmer recovery**, with the latest survey data suggesting that short-term industrial strength is likely to continue being a key driver for growth in Q4.

Q3 GDP growth mainly driven by slower destocking; demand remains weak

The breakdown details of Q3 GDP data suggests the main driver to growth from the expenditure side has been a positive inventory contribution of around 0.4pp (after subtracting 0.7pp and 0.9pp in the previous two quarters), reflecting a slower pace of destocking. By country, this largely reflects a strong positive contribution from Germany (+1.5pp after -2pp in Q2). Net trade contribution was modestly positive for the second consecutive quarter (0.15pp).

Overall, though, the latest GDP data has yet to provide any convincing evidence that suggests domestic demand has embarked on a sustainable recovery. Private consumption in the euro area contracted around 0.2% qoq in Q3 09 (-1.1% yoy), highlighting the fragility of consumption away from the temporary boost from car sales in view of government scrappage incentive schemes. The decline largely reflects weak private consumption in Germany (-0.9% qoq after strong growth of 0.6% qoq in Q2 and 0.9% qoq in Q1) as the impetus from car sales dissipated, although consumption was also weak elsewhere (flat qoq in France, -0.1% qoq in Spain and -0.4% qoq in the Netherlands).

Private consumption will continue to be restrained by weak labour market dynamics. We expect euro-area unemployment to rise from its current 9.8% rate (October), despite our view that the German labour market will continue to surprise by its resilience. This continues to be supported by the most recent data (as well the *Bundesbank November Monthly Bulletin*, which noted that a sharp increase in unemployment in the near term is not now expected, a very significant shift compared with a month ago, when it still expected a sharp deterioration), due to effective government short-time working schemes.

Despite the relatively muted impact of the recession on official unemployment rates, consumer fears of unemployment over the next 12 months hit historical highs earlier this year, well in excess of the previous historical peak recorded in the 1993. While these fears had been receding, the November EC survey featured a renewed rise in unemployment fears and they remain elevated at levels almost twice their historical average. Unemployment fears are likely to prevent the household savings rate from reversing quickly its recent sharp rise.

Investment in the euro area has also remained weak in Q3 (-0.4% qoq), as ongoing large declines in France (-1.4% qoq) and Spain (-2.3% qoq) look to have outweighed a second quarterly increase in Germany (1.3% qoq). However, this would be consistent with a slightly less negative annual decline in investment (-10.4% yoy in Q3 vs -11.4% yoy in Q2), suggesting it may be bottoming out albeit at very weak levels. **The latest available breakdown of euro-area investment (Q2) shows 70% of the weakness is explained by the metal/machinery and transport equipment sectors,** which probably explains why the German investment cycle has already turned. The other major drag is from housing investment, which continues to contract at a substantial pace albeit slower than a year ago (-2.0% qoq in Q2 09 vs -3.5% qoq in Q2 08).

Inflation to rise to 1.0% by year-end; remain moderately positive in 2010/11

The euro-area flash November HICP (0.6% yoy, in line with our forecast), confirmed a return to positive annual inflation rates. We expect a further rise in headline euro area inflation to about 1.0% yoy in December. **It is important to recognise this relatively quick rise in inflation is being predominantly driven by technical factors (e.g. unfavourable base effects) and will not be sustained, in our view.** We expect inflation to remain around 1.0% in 2010, a sign that inflationary pressures are nonexistent in the context of ongoing weak demand (a function of rising unemployment) as well as the absence of any cost pressures due to large spare capacity. Euro-area core inflation continues to trend lower and at 1.15% yoy in October is at its lowest since February 2001. Euro-area core inflation continues to be dominated by a collapse in some smaller-weighted countries (e.g. Spain, Ireland and Greece) offsetting some surprising stickiness in Germany, France and Italy, a divergence that complicates the ECB's job.

ECB to implement phasing out of nonstandard measures

At its December meeting, the ECB announced a new liquidity setup, making it the first major central bank to actively remove some unconventional measures. The most important takeaway, in our view, is that liquidity will remain extremely abundant" at least over Q1 and that the changes on the liquidity provision should "be interpreted in no respect as a signal on interest rates".

Overall, our core view remains that the ECB will remain on hold over the course of 2010. This view is based on our macro forecasts that while the region will not experience a double dip, the recovery will be subpar. Against this backdrop of soft growth, core inflation and more importantly wage dynamics are likely to ease for the best part of next year. The upcoming wage negotiations in Germany at the end of Q1 will likely seem a very tame outcome. Other factors playing in favour of an ECB refi rate on hold include the appreciation of the currency or the risk of overshooting should the ECB be perceived to act before the Fed. Finally, and perhaps most importantly, we believe that the council will view the rise in the overnight rate next year (which will be part and parcel of the phasing out of the liquidity measures) as a tightening in monetary policy, thereby postponing the timing of the first increase in the policy rate.

As for 2011, we believe the ECB will embark on a normalisation process of the policy rate that we think will be gradual. We forecast ECB rates will reach 2.25% by end-2011.

China

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Overcapacity worries are a 2011 issue

China's recovery continues to strengthen. We expect 4Q GDP growth to reach 10% and remain at this pace through 1Q and 2Q. Fiscal stimulus should continue throughout 2010 and fixed investment growth should remain firm, led by accelerating residential investment demand.

The commodity market may be buoyed by further short-term improvement in the data. We expect industrial production and export growth to reach 20% in 1Q. Base effects will be largely to blame for the sudden rise in yoy growth rates, as activity collapsed the same time last year. Nonetheless, the market tends to focus on yoy changes, rather than the underlying trend, and should respond positively to the results.

Talk of policy tightening should also grow as inflation reaches 2% in 1Q. The PBOC is reportedly reluctant to tighten policy ahead of the US Federal Reserve for fear of attracting capital inflows. However, it will struggle to delay tightening as economic activity strengthens and inflation expectations deteriorate. The latter are especially important to the PBOC, and **we forecast a first hike in the policy rate, the 1-year lending rate, in 2Q.**

Export demand may disappoint again in 2H09 as base effects fade in effect. Fiscal stimulus was expected only to bridge temporary weakness in global demand, to judge by official statements, and China may be surprised by a weak recovery in export demand. Unfortunately, not enough effort has been spent on finding alternative growth drivers through economic reform and private consumption cannot yet drive growth.

Thus, we believe there will be temptation to **extend fiscal stimulus through 2011 to offset still flagging export demand. If so, the stimulus will include further fixed investment given a lack of policy alternatives.**

The risk is that protracted fiscal stimulus will produce overcapacity in the heavy industrial and property sectors. And while the government is demonstrating increasing caution towards such risks in the industrial sector, it has yet to seriously tighten policy towards the property sector. Importantly, residential investment is a major driver of GDP growth, as are the purchases of furniture and home electronics used to fill new homes.

Domestic commodities production is thus likely to be strong as domestic producers anticipate further stimulus. Provincial governments will also be keen to spur GDP growth rates in their own provinces through strong industrial production, especially steel production. The central government is certainly aware of these problems, but nonetheless finds it challenging to curb such production without aggressive policy tightening.

The chances of a correction in growth are thus greater in 2011 as fiscal stimulus must eventually be withdrawn and the economy will be left trying to digest too many homes and factories.

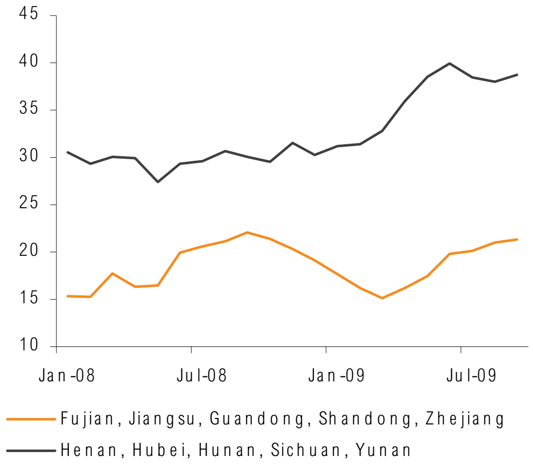
What is needed, in our view, is more attention to economic reform and a lowering of the GDP growth target. This would help the government find new growth drivers while limiting the risk of rising capacity. Importantly, the economy must not only rebalance away from domestic to external demand, but also from manufacturing to services activity. If such a change was to take place, it would put the economy on a more sustainable footing.

In the meantime, **we expect that China's bid for operational commodity-related assets will grow as the country attempts to diversify a share of its US$2,272bn worth of FX reserves.** Local media debate on the issue has also increased significantly over the past few years, and that helps to generate headlines in the English-language newswires. Worries about a weakening US dollar and rising US government debt will further spur such debate.

There is a slow shift in strategy whereby China is increasingly opting to buy minority stakes in commodity producers, in recognition that its earlier strategy of trying to buy outright stakes have met with resistance in developed markets. The country's sovereign wealth fund, the China Investment Corporation (CIC), has assisted this strategy and reportedly has requested an additional US$200bn of funds in 2010.

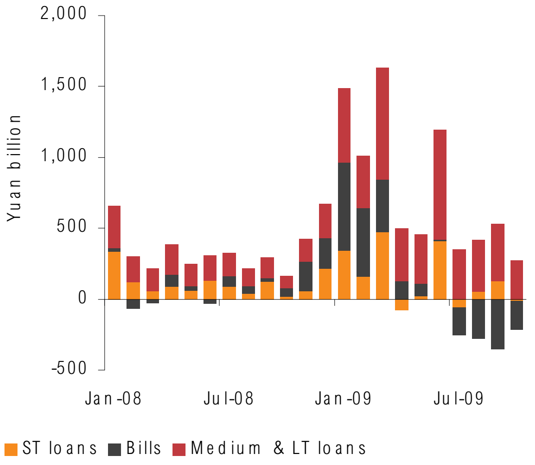
It is meanwhile difficult to measure the amount of private speculation in commodities. Speculators were aided by an easy monetary policy in 1H09. However, credit growth has since slowed. Importantly, short-term bills, believed to be an important source of funding for speculators, are contracting, as illustrated in the chart below. We expect credit growth will be a lower 6-7trn yuan in 2010, vs a forecast 9.5trn yuan in 2009.

Figure 1: Fixed investment is markedly slower in the less-developed interior provinces



Source: CEIC; RBS

Figure 2: Credit growth has slowed, and short-term bills are contracting



Source: CEIC; RBS

Japan

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Back to deflation

The Q3 GDP expansion at 4.8% qoq annualised was well above the upper range of market expectations. As expected, fiscal stimuli and stabilisation of overseas demand boosted overall GDP and the restocking of corporate inventories pushed domestic demand up. Given that public investment is likely to decrease from early next year due to the current government's decision to freeze the FY09 supplementary budget at ¥2.9trn, we believe GDP growth may fall into negative territory early next year. After a possible economic soft patch in H1 10, we think business activity may gain momentum, helped mainly by overseas demand. Given that the increase in exports was brisker than we had expected early this year, together with the government's announcement of formulating additional economic stimulus packages at least until the end of this year, we raise our GDP forecast from -5.8% to -5.3% for 2009, and from 0.9% to 1.4% for 2010. We believe steady growth will continue in 2011.

Despite this continued positive growth in the coming years, the negative output gap, -6.8% or ¥38trn in 3Q09, is likely to be sustained over many years. If we assume 0.5% potential growth and 2% steady economic growth to continue, it should take until the end of 2013 for the output gap to return to positive territory. **As a result of the remaining negative output gap for the forecasting period, we expect core CPI to continue to see negative growth in 2010 and 2011.** Also, an appreciation of the JPY would put further downward pressure on CPI.

Policy outlook. The multifiscal stimulus measures and consecutive growth are not enough to persuade the Japanese authorities to proceed towards policy normalisation. On 20 November, the government officially declared that Japan was in 'mild deflation' and said it would formulate additional stimulus measures by the end of this year, despite mounting fiscal problems. However, we think the government's surprise deflation declaration would be less of a sudden change in its price outlook than a step toward loosening fiscal discipline given the upcoming political schedule – the Upper House election in July 2010 in particular.

In an unscheduled monetary policy meeting held on 1 December 2009, the BOJ announced additional easing measures, principally the supply of ¥10trn of funds at 0.1% with three months duration and to maintain overnight target rate at 0.1%. On the other hand, a noteworthy development was that the bank clearly stated the aim of funds-supplying operations: to 'encourage a further decline in longer-term interest rates'. We think this decision aimed to show the BOJ's stance to deal with deflation and a stronger yen: proactively but with minimum action.

Given that the government's pressure to call for additional monetary easing measures is likely to continue, the next likely step to be taken by the BOJ would be quantitative measures, such as increased buying of TDB (short-term bills) or even JGBs, despite the bank note rule. The reason behind this is the government's severe debt issue.

Despite the new policy measures just announced, we believe that the BOJ will be eventually pushed to take additional monetary easing steps in response to these proactive government attempts. However, these measures failed to combat deflation effectively – especially in the QE periods in 2001-06. We think the bank is more likely to enhance the policy-duration effect by specifying a numerical indicator as the criteria (CPI, for instance) and by defining a recovery range for the indicator (e.g. 'increase to above zero steadily' during the QE period) rather than expanding its balance sheet.

Non-Japan Asia

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Still not there

We introduce our 2011 forecasts. For the non-Japan Asia (NJA) aggregate, we forecast GDP growth of 7.5%, modestly lower than in 2010. This reflects a stabilisation of economic activity following a recovery in 2010. This aggregate forecast is heavily biased by the heavy weightings assigned to China and India, which are likely to deliver superior performance. On an ex-China and India basis, we forecast 2011 growth of 4.9% yoy compared with 5.3% in 2010. Even this forecast masks an uneven pattern – growth in the region's advanced economies (Hong Kong, Korea and Taiwan) is likely to slow after an initially strong recovery. The less developed part of NJA will continue to grow strongly, in our view, benefiting from a host of structural issues such as better investment opportunities, consumerism and favourable demographics.

Our forecasts are based on two critical assumptions – the global environment will continue to recover albeit full normalcy will not be restored. Equally, regional policymakers should become more decisive in augmenting domestic demand via reorienting fiscal policies and allowing for currency appreciation, but are unlikely to have fully attained this transition. We believe overall growth can be expected to remain below trend, but with a narrower output gap. A more interesting dynamic would be that exports are likely to make a larger contribution to growth in the export oriented economies and vice versa.

We forecast inflation will remain fairly well behaved, although the quarterly trend is likely to be accelerating. Our full-year average inflation forecast is based largely on the consideration that lingering excess capacity will not allow for demand pull pressures to emerge. Nonetheless, this forecast is subject to considerable risk – should the unsettling combination of rising commodity prices and rapid capital inflow induce even stronger monetary growth, inflation could spring a nasty surprise. Regardless of its nature, headline inflation could end up well above our benign forecasts. In this context, we have factored in higher but tame increases in policy rates – this consideration is built more on the need for central banks to normalise policy rates.

The most pressing issue for investors continues to be capital flow management and the attendant fear of capital controls. Intervention fatigue mainly from rising sterilising costs has led to a tightening of administrative controls on FX inflows. However, we continue to rule out the possibility of stringent capital controls. Malaysia and Thailand's previous experiments with capital controls had produced very unfavourable results; the effectiveness of capital controls has yet to be established and may even deter valuable flows like foreign direct investment (FDI).

So how will policy makers manage these flows? Apart from the above discussed administrative measures, we believe that policymakers will need to accept currency appreciation as a policy tool. This is a necessary and integral component of global rebalancing. Fears over loss of competitiveness are understandably legitimate, but should dissipate when China revalues the renminbi, presumably from Q2 10. The authorities are also likely to consider further tightening of bank lending standards into speculative sectors like property and supply side measures such as an increase in land supply for construction. Overall, capital flows are a challenge for NJA policymakers and no one response is likely to suffice.

FX

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Darwin's theory of currency evolution

In a world with a diminishing sweet spot for risk, will Darwin's theory of currency evolution prevail?

Darwin's theory of currency evolution refers to a belief that in the post-crisis environment, the strong get stronger and the weak currencies get weaker. The strong currencies usually have some existing yield advantage because their financial sectors were not emasculated in the crisis. These yields tend to attract capital, and with it stronger asset markets that stir up domestic demand and lead to pressure for higher rates and a stronger currency. At the other end of spectrum are countries that exhausted conventional policy options, monetary and fiscal, and are trying to 'get back to zero' as they withdraw from QE and the implied need for negative rates, while simultaneously starting the long march back to fiscal prudence. We are not about to withdraw from trades that are essentially short the epicentre of the storm against the higher yielding currencies that particularly in the commodity realm have had positive terms of trade shocks. Sell the G4 basket trade vs a combination of our favourites: the AUD, NOK, Israeli shekel, IDR, Korean Won and Brazilian Real, to name a few.

But how does this Darwinism end? Currencies ultimately hit overshooting extremes and the process turns on itself. For the strong currencies, valuations reach such levels that the risk of sizable long-term losses starts taking out the longer-term participants first and the support for currencies slowly peels away, working its way down to punters with ever-shortening time horizons. But here is the rub – tighter policy (at least the fed funds rate) is not likely to occur before H2 2010, for the Fed must first see how the tightening implied by the end of its MBS purchases is absorbed. Because tightening risks are still delayed, we continue to work on the basis that expectations on rates have not killed the overall risk positive trade yet. There is still a sizable window to leap through, where growth is positive and key G4 rates are steady at near zero financing levels. AUD/USD, for example, can in the interim still make the leap to parity.

Nonetheless, the end game for generalised US dollar weakness is becoming more apparent. Last month, we suggested that the "core macro question of our time" was whether the risk rally petered out because of an unsustainable recovery, or, a sustainable growth rate with higher rates. The latest data has played to our belief that although the recovery looks stilted and vulnerable to setback (one year into recovery, even 2.5% to 3% real US GDP is half the average post war recovery growth rate), it continues to favour risk turning down because of tighter policy, rather than weak growth. This meaningfully curtails the US dollar's tail risks (EUR/USD above 1.60) associated with another downturn with attendant fiscal problems and debt monetisation fears.

Our US dollar forecast then still pivots into mid-year, where EUR/USD peaks in the mid 1.50s and the Japanese yen will once again be 'promoted' to funding currency in chief. USD/JPY is likely to be protected by the BOJ at ¥80-85 and long KRW/JPY is the best way to express a short yen trade. Of the other majors, we expect sterling will remain most encumbered by fiscal consolidation and deleveraging, while the Swiss franc breaks out of its corset and gains sharply against the euro when the need for SNB tightening contradicts current intervention policy. The SNB will probably be ahead of a better synchronised Fed and ECB rate cycle. Changes to G2 policy should prompt the sharpest shift in the risk pendulum into H2. It is still shaping up to be a game of two halves, with everything to play for in 2010.

Technical analysis

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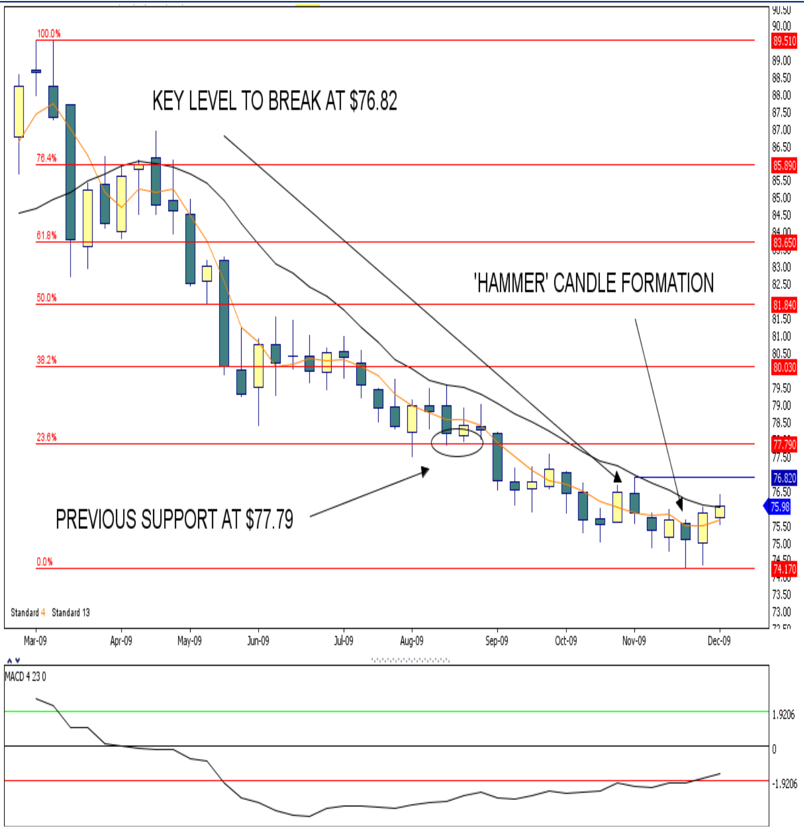
US dollar index – A clear downtrend that began on 20 April 2009 may just be showing signs of a reversal; the 'hammer' candle formation signals bullish price action to come, followed by a bullish engulfing key day reversal, price action above the quarterly moving average (13, in black) and the MACD indicator (4,23,0) crossing the 'signal generating' red 25% line the same day as the bull candle pattern. Although US$77.90 looks the most immediate target, the breaking of US$76.82 would be more significant because it would represent a higher high than the previous and confirm the end of trend. Whichever price action gets to first, either above US$76.82 or below US$74.17, could spell the mid- to long-term direction of the index.

RES: US$76.82 US$77.79 US$79.51
SUP: US$75.58 US$74.17 US$71.31

DXY Index – weekly candle chart with Fibonacci retracements and 4- and 13-event standard moving averages

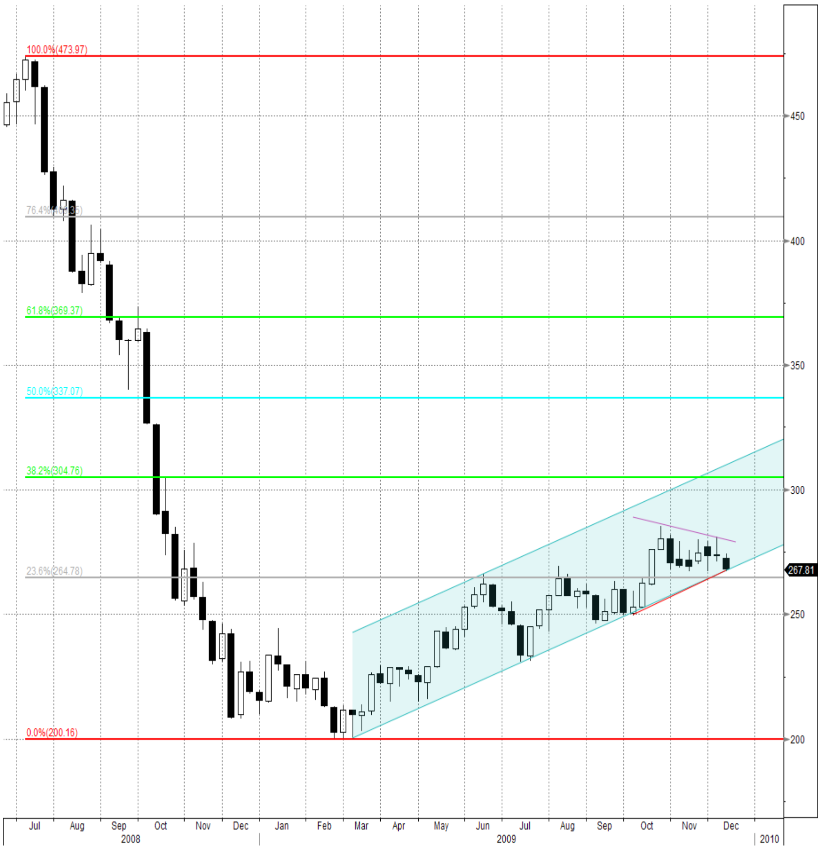


Source: Tradermade

CRB Index –The mid-December bearish candle activity puts pressure on the bottom of a long standing line of support at the bottom of the channel, and flirts with the 23.6% (US$264.8) level. A breaking of this level on the downside opens up some previous significant highs as targets: US$266.17, US$256.33 and US$250 are the most immediate. To continue this bullish theme, US$285.2 needs to be broken to mark a higher high. Price action looks bearish to ranging, although should the completion of a potential bullish triangle be completed (depicted by the red and purple lines) a fresh target of above the 38.2% (US$304.8) looks possible. We expect a flat market into year-end, especially if new support is found at US$264.8.

RES: US$280.91 US$285.2 US$304.8
SUP: US$266.17 US$264.8 US$256.33

CRB Index – weekly candle chart with Fibonacci retracements

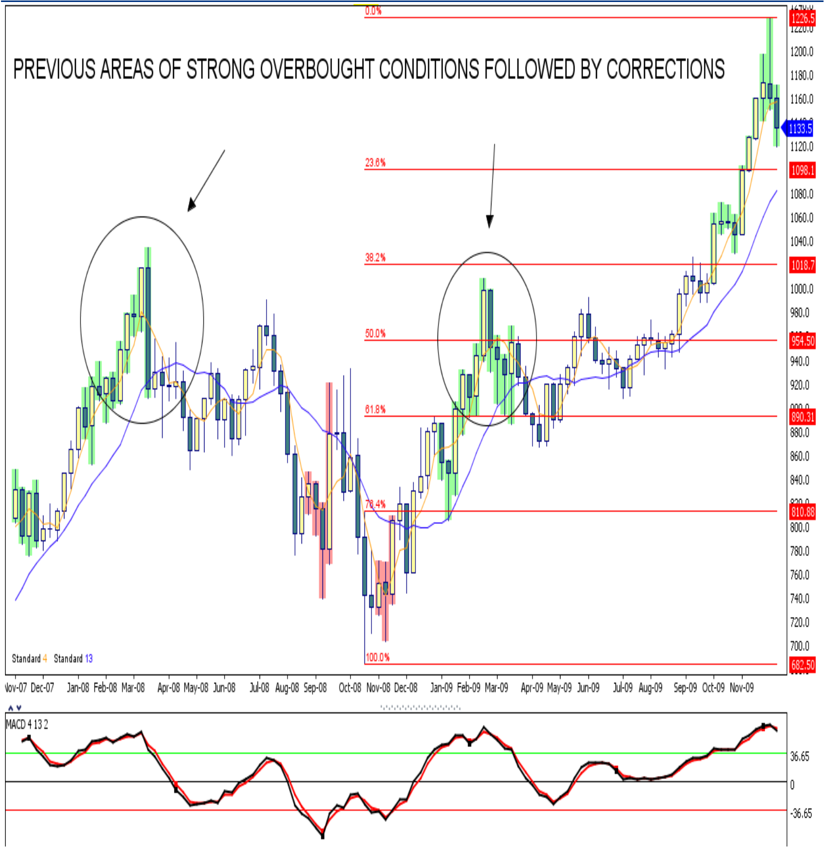


Source: Bloomberg

Gold USD – The chart suggests that following an ‘unsustainable’ rate of gold strength (price candles highlighted in green) a price action correction ensues. From mid February to late April this year a US$141/oz correction occurred, whilst from March to April of 2008, a correction of US$186/oz took place. Using the Fibonacci retracements on the current trend as a guide, US$1,098/oz looks the most obvious target for the current correction, or perhaps as low as US$1,071/oz, which was the 12 October high as alternative target. On the assumption that the price bounces from its correction and continues to be bullish thereafter, we look for US$1,355/oz, a 123.6% projection of the current move, as an upside target. Should this present correction make a lower low and fall to below US$1,027/oz and then US$1,019/oz, a macro sentiment change could bring US$954/oz and US$890/oz into contention.

RES: US$1,195 US$1,226 US$1,354
SUP: US$1,098 US$1,070 US$1,018

Gold – weekly candle chart, with Fibonacci retracements and 4- and 13-event moving averages

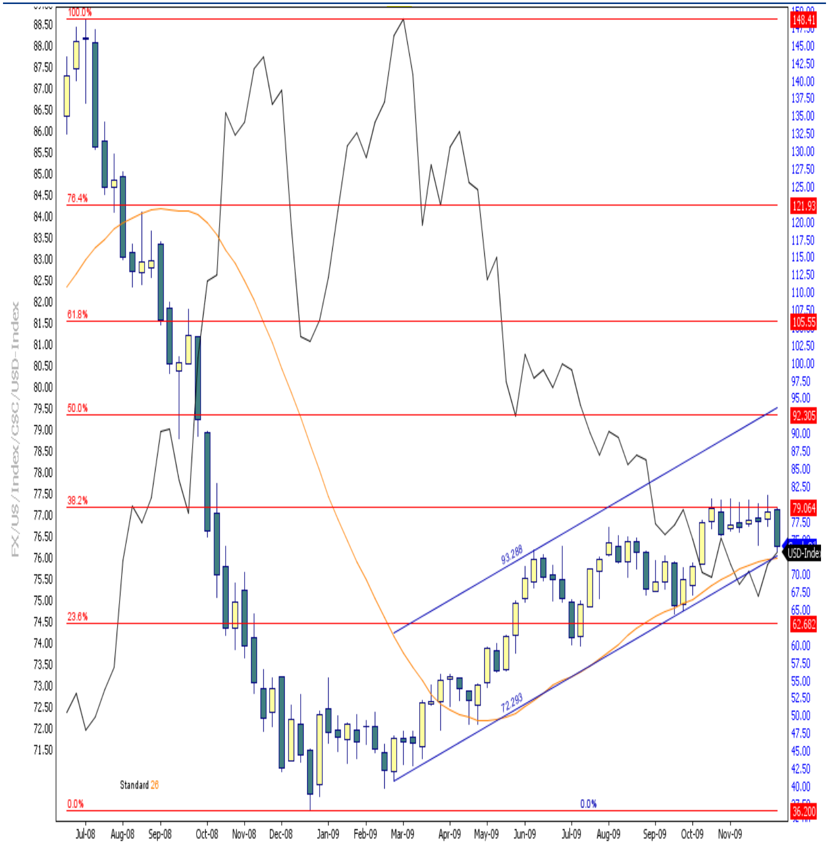


Source: Tradermade

Oil – From a technical perspective, it seems that a changing in price action sentiment is afoot. A US$79.6/bbl (38.2% retracement of the July-December price crash) again proves elusive on a weekly close, price action failing to retest the top of the channel and a bearish engulfing candle for the current week all signal perhaps the strongest indication yet that the up trend is coming to an end. A breaking of the channel on the downside, a negative crossing of the six-month moving average (26-event, in orange) and making a new low below US$71/bbl would confirm an end in trend and open US$63/bbl as a new downside target for Q1/Q2 2010. On the other hand, the breaking of US$79/bbl on a weekly close, and a return establish a new high above US$81/bbl would open US$92/bbl as the target for Q1 of next year. Out of the two scenarios, the former seems technically more likely.

RES:$79.1 $88.3 $92.3 $100.0
SUP: $71.3 $67.5 $62.7 $59.5

Brent Oil – weekly candle chart with Fibonacci retracements, a 26-event moving average and a US dollar index overlay

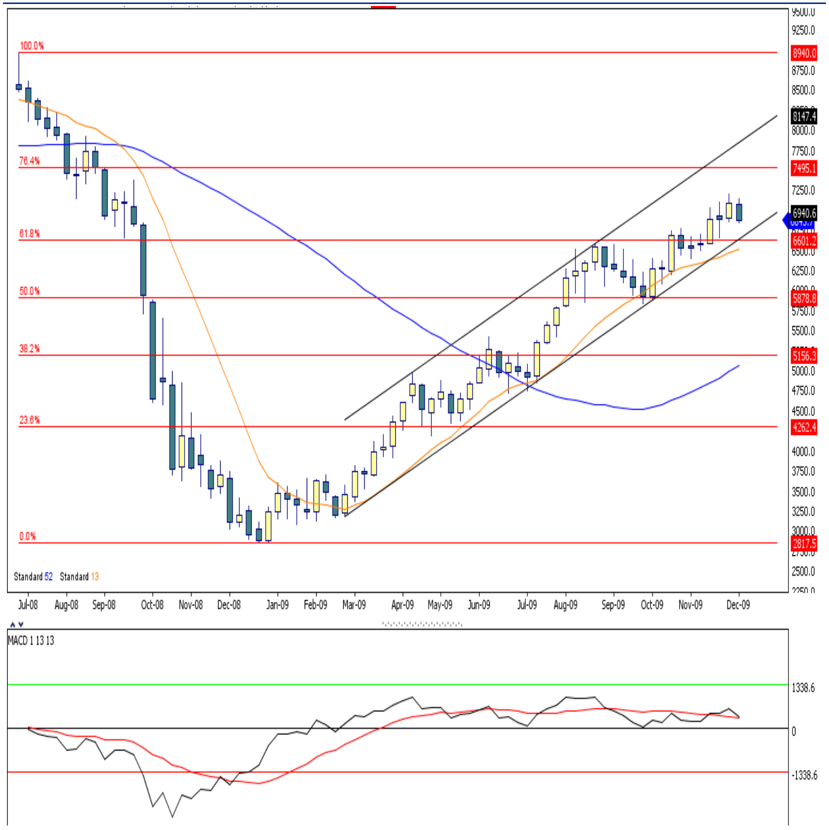


Source: Tradermade

Copper – Unlike the majority of the other commodities, copper has already retraced over 61.8% of its losses sustained from the July 2008 bear market asset rally. In doing so, the quarterly moving average (13, in orange) has correlated with the bottom of the channel and supported the price action throughout; using a MACD indicator of 1,13,13n the distance between the two black lines represents the distance between the current price and the moving average. When these lines cross it could represent a key indicator as to when this trend could be coming to an end. Activity during this bull rally has also reacted significantly around the Fibonacci levels indicating US$7,495/t as the next target and could be achieved by mid-January/mid-February 2010, although corrections to the base of the channel should be anticipated on the way up.

RES: US$7,170 US$7,495 US$7,889
SUP: US$6,733 US$6,601 US$6,363

Copper – weekly candle chart with Fibonacci Retracements, a MACD (1,13,13) indicator and 13- and 52-event moving averages

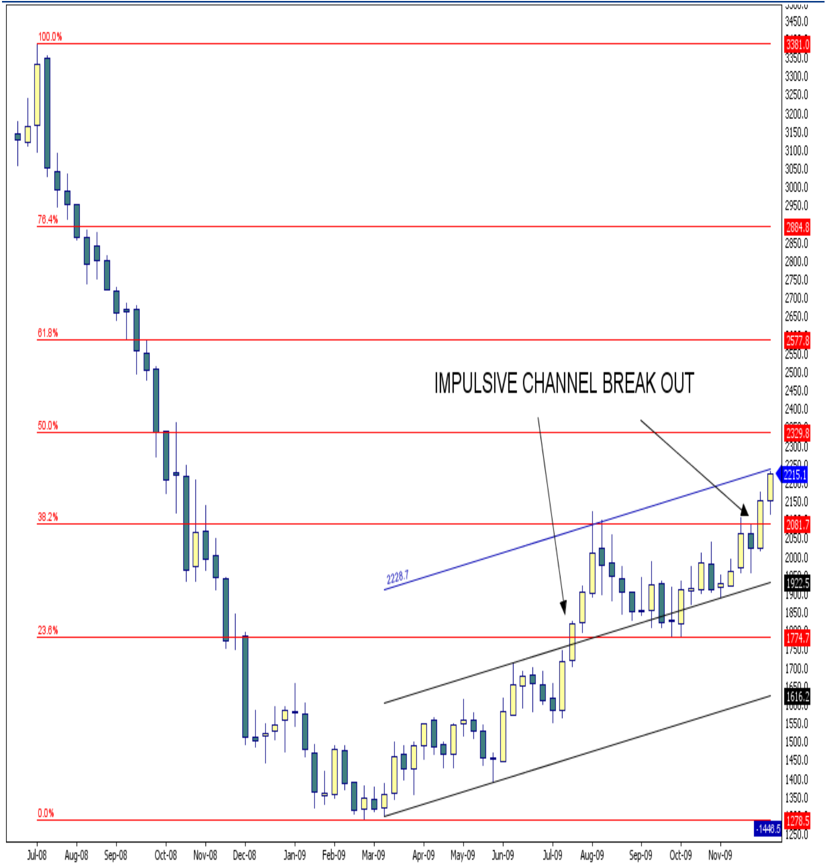


Source: RBS

Aluminium – At one stage, it appeared that the 38.2%, at US$2,082/t, retracement line was going to prove as significant resistance on a weekly close basis until the impulsive break witnessed on the week commencing 30 November 2009. Having broken this and the previous high of US$2,115 made on the week commencing 3 August, US$2,330/oz becomes the target into year-end. The channel delineated in black contained price action for 19 weeks before a break out in the 20th, the blue line, a multiplier of the channel, has contained price action for now 19 weeks with this, the 20th, looking increasingly more like to break out. In summary, from a technical perspective there is little to suggest anything other than a bull market, as mentioned; US$2,330/t looks a sensible target into the new year and US$2,578/t for end-Q110.

RES: US$2,312 US$2,330 US$2,578
SUP: US$2,115 US$2,082 US$1,980

Aluminium – weekly candle chart (US$) with Fibonacci retracements

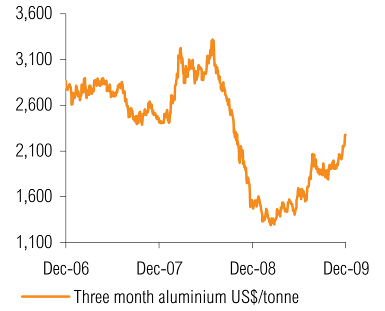


Source: Tradermade

Aluminium

Crouching tiger, hidden talents

Aluminium – recovery hopes help drive price up 80% from its lows



Source: LME

Our firm message is don't be short aluminium exposure for 2010. In our October review, we elevated aluminium from our least preferred base metal and replaced it with nickel. We are delighted to report that aluminium has not disappointed and has had a spirited run over the past quarter, with its price in December trading at its highest levels in 14 months. Funds have been attracted by its broad spread of consumer end uses, which translates into strong gearing to the upcoming recovery in real demand. Remember, too, that annual aluminium consumption around 35mt is double the size of copper's. Aluminium is a strong, deep, vibrant market and the light metal is no slouch in terms of demand growth potential, either, when it comes to economic recovery.

We reiterate that there is no cloak-and-dagger mystery about aluminium's issues. Exchange inventories are still at record highs of nearly 5mt, with total reported inventory forecast to end-2009 at an onerous 6.60mt, equivalent to 10 weeks of consumption. Meanwhile, Chinese aluminium producers have thrown caution to the wind, and reactivations and new capacity have added a notable 4.8mtpa of additional capacity, a rise of 47% since the March 2009 low.

The good news is that RBS forecasts world GDP rising by 4.1% yoy in 2010 and a further 4.4% in 2011. Such growth has historically translated into a consumer restocking episode, and we forecast three consecutive years of above 8% pa aluminium demand growth. This should be good for inventory erosion and indeed, already combined LME and Shanghai aluminium inventory has in Q4 09 risen the least in two years. Note, too, that producer inventories and Japanese port/consumer stocks are close to record lows. Our plea is that it is essential for western producers not to emulate China's premature capacity reactivation, until real demand growth has emerged. Don't kill the golden goose.

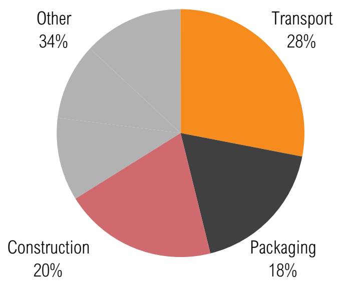
RBS world aluminium supply/demand outlook to 2013F; world demand growth on the verge of robust rebound

(m tonnes)	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**
World primary aluminium production	**33.90**	**38.15**	**40.12**	**37.50**	**39.00**	**41.25**	**44.00**	**46.65**
Change (%)	**6.0%**	**12.5%**	**5.2%**	**-6.5%**	**4.0%**	**6.0%**	**7.0%**	**6.0%**
Total Asia (includes China & Middle East)	13.08	16.57	17.92	18.00	21.00	23.25	26.00	28.50
Change %	17%	27%	8%	0%	17%	11%	12%	10%
of which China	9.32	12.57	13.70	13.00	16.50	18.00	18.75	20.00
Change %	*19%*	*35%*	*9%*	*-5%*	*27%*	*9%*	*4%*	*7%*
Europe (Including Russia)	8.87	9.22	9.76	8.15	7.50	7.50	7.75	8.00
Change %	-1%	4%	6%	-16%	-8%	0%	3%	3%
of which North America	5.33	5.64	5.78	4.75	4.50	4.75	5.00	5.25
World refined aluminium consumption	**34.50**	**38.00**	**37.42**	**34.50**	**38.00**	**41.00**	**44.25**	**47.40**
Change (%)	**8.0%**	**10.0%**	**-1.5%**	**-8.0%**	**10.0%**	**8.0%**	**8.0%**	**7.0%**
of which Asia	16.30	19.80	20.20	20.50	23.00	25.25	27.75	30.00
Change %	13%	21%	2%	1%	12%	10%	10%	8%
of which China	8.75	12.10	12.60	13.50	15.25	17.00	18.75	20.55
Change (%)	22%	38%	4%	7%	13%	11%	10%	10%
of which Europe	8.90	9.40	8.80	7.00	7.25	7.50	8.00	8.75
Change %	5%	6%	-7%	-20%	4%	3%	7%	9%
of which North America	7.20	6.50	6.00	4.75	5.15	5.65	6.00	6.25
Change %	0%	-10%	-7%	-21%	8%	10%	6%	4%
Implied market balance	**-0.60**	**0.15**	**2.70**	**3.00**	**1.00**	**0.25**	**-0.25**	**-0.75**
Actual reported stock	2.70	2.80	4.55	6.60	7.30	7.10	6.85	6.10
Stock: consumption ratio (weeks)	**4.0**	**3.8**	**6.3**	**10.0**	**10.0**	**9.0**	**8.0**	**6.5**
LME spot aluminium price (US$/tonne)	**2,565**	**2,640**	**2,570**	**1,665**	**2,200**	**2,400**	**2,650**	**3,000**
LME spot aluminium price (US¢/lb)	**116**	**120**	**117**	**75**	**100**	**110**	**120**	**135**
Change % yoy	**35%**	**3%**	**-3%**	**-35%**	**32%**	**9%**	**10%**	**13%**

Source: CRU, IAI, WBMS, LME and RBS forecasts

Demand – stirring from its slumbers in 2010-11F

Aluminium consumption by key sector offtake



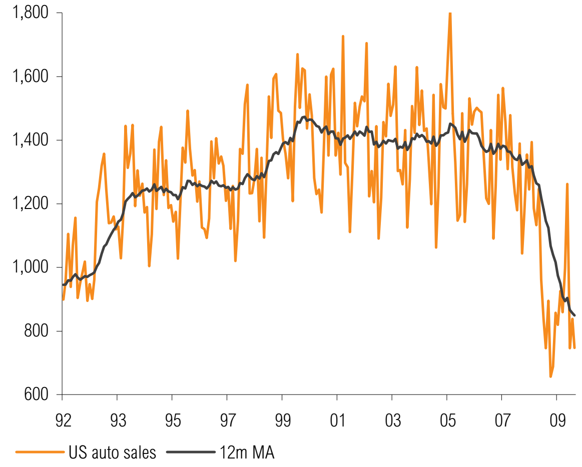
Source: CRU

We confidently expect that 2009 will prove to be the nadir for world aluminium consumption which has, courtesy of the recession, now endured two consecutive years of contraction. The 2008-09 period will have seen offtake fall by over 9% to 34.50mt, equivalent to 3.50mt of metal lost to the recession. Aluminium's use in a broad range of end-use sectors, such as transport, construction, packaging, electrical and consumer durables, means there has been scant hiding from slumping demand. But we believe the aluminium market will now benefit from the flip side of improving world real demand. Historically, aluminium has shown potent demand growth in upswings of the world economy. Why should it be any different this time around, particularly with China having held up so well? We also expect real consumption growth to be augmented by consumer and distributor restocking. Our long-run trend growth forecast for world aluminium demand is 4% pa, but we forecast that through until 2013, aluminium will enjoy above trend growth of 8% pa.

Cash-for-clunkers schemes – now unwinding, job well done

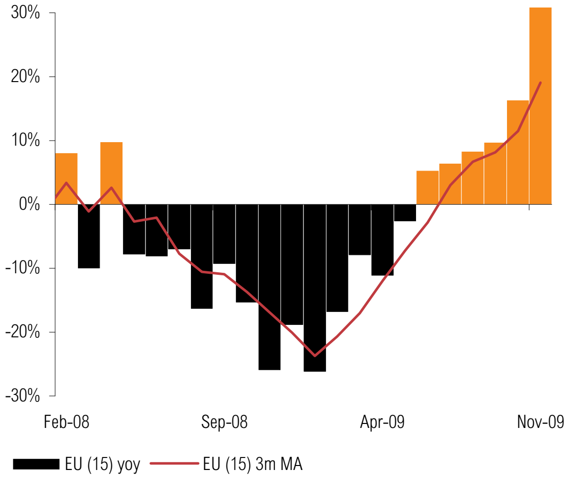
Transport applications are a key demand driver for aluminium. Its use in vehicles arises from, among other properties, its weight-saving advantages over steel in such applications as engine blocks, alloy wheels and vehicle space frames (no rusting). One of the key areas for renewed aluminium demand growth has been from the very successful government cash-for-clunkers subsidy schemes, which reversed many of the substantial production cuts made by some of the world's key automobile manufacturers. The US clunkers scheme was closed barely a month after it was introduced, for fear of breaching the US$3bn ceiling allocated by Congress. The chart below left shows the substantial clunker-inspired 27% yoy rebound in US auto sales in August as buyers rushed to meet the scheme, and subsequent 41% slump in September after the scheme came to an end.

Total US auto sales hit 17-year lows in January 2009, but rose to 15-month highs (units of vehicle sales)



Source: Bloomberg and RBS

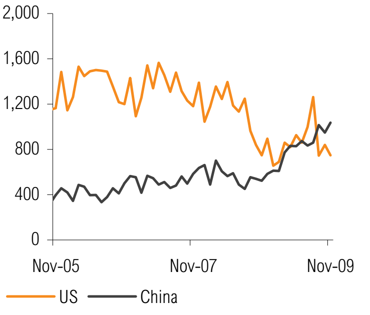
Percentage change, monthly EU passenger car registrations – excellent recovery under way (yoy)



Source: ACEA and RBS

The cash-for-clunkers schemes originated in Europe, led by Germany before spreading like wildfire to other countries. The right-hand chart above shows data from the European Automobile Manufacturers' Association (ACEA) for the European Union. Prior to the clunker scheme introduction, each month saw registrations slide more. The contraction in EU15 passenger car sales stopped in January 2009, with registrations down over 26% yoy. But as our chart, shows they have now rebounded to post six consecutive months of net increase, with registrations up 31% in November. Yes, we are concerned that the scrappage schemes have merely brought forward future sales and 2010 may see a relapse when the schemes expire. However, we note that such has been the success of the schemes that some EU countries are showing signs of supporting the schemes into 2010, with Germany allowing delayed deliveries under its scheme into 2010. Whatever the ethics of scrapping perfectly functional vehicles, the net effect will be to reduce the average age of the vehicle fleet; replacing vehicles with poor emission levels with more fuel-efficient, lower emission vehicles and with better safety features.

Chinese passenger car sales vs US light vehicle sales; (000 units)

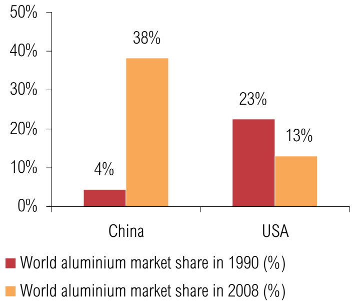


Source: RBS, Motor Associations

The end of the vehicle scrappage schemes is an example of one of the new headwinds that metals, including aluminium, will face in 2010. The hope is that the unwind will dovetail with a resurgence in fresh underlying demand as consumers begin to deploy capital as optimism rises that the worst of the economic recession is over. But we also highlight the rise of China, which is now the world's biggest car market. As our sidebar chart shows, China has now overtaken the US as the largest car market, with annual sales expected to be a record 13.5m units in 2009. Data from the China Association of Automobile Manufacturers shows that passenger auto sales in November surged 98% the most in five years to 1.04m units. Luxury marque BMW announced in November that it is planning to sharply increase its car production in China. Capacity at its existing 30,000-unit factory is scheduled to rise to 75,000 units by end-2010 and a new factory is planned to produce 300,000 units.

World aluminium demand looks set to accelerate into 2010 and beyond

China's share of world aluminium demand has risen from 4% to 38%

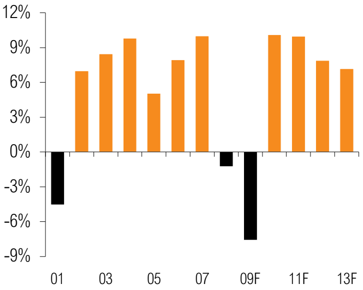


Source: WBMS and RBS

World aluminium consumption in 2008-09, by falling over 9%, endured a significant growth dislocation not unlike that seen after the two oil shocks of the mid-1970s and early 1980s. Crucially, we view aluminium demand as being interrupted, not permanently downsized. Between 2001 and 2007, world aluminium demand increased at a CAGR of 8% pa, double the 4% pa growth rate of the second half of the 1990s. The key reason for this above-trend growth was the boost that aluminium demand received from rapidly growing Chinese consumption, which averaged a CAGR of 23% pa over the same period.

Forget about the past – the excitement is now 2010, a year in which most of the key aluminium-consuming regions should start to claw their way out of recession. Evidence abounds, with US GDP recovery, housing starts and auto production on the rise and positive data from Chinese auto sales and rising floor space under construction. The Chinese urbanisation and industrialisation theme endures. Historically, China has been structurally long aluminium and exports have been onerous. However, all that changed in 2009 and China has been a significant importer of primary aluminium and products. Customs data showed that in January-October 2008, China imported 0.102mt of primary aluminium; contrast that with the January-October 2009 imports of 1.397mt – a seismic change in imports. Yes, we are concerned about internal inventory building, but also encouraged that China is merely preparing for robust consumption growth expectations in the years ahead.

Yoy change in world aluminium consumption, 2001-13F

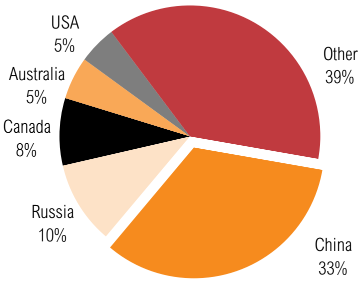


Source: CRU and RBS

RBS economists forecast that world GDP growth will increase by over 4% in both 2010 and 2011. We expect this to have positive implications for world aluminium offtake, which we forecast will increase by 10% in 2010 to 38mt (back to the level of 2007) and a further 8% in 2011 and 2012. The usual pattern is that improving consumer confidence initially results in low-ticket item purchases, such as white goods (dishwashers, washing machines, freezers). Off a low 2009 base of 34.50mt, we forecast that world aluminium demand, augmented by consumer restocking, will rise by 3.50mt in 2010 to 38.00mt and a further 3.00mt in 2011. Between end-2009 and 2013, we forecast world aluminium demand will rise by 12.90mt, a CAGR of over 8.0% pa.

Supply – China reactivates 75% of idled capacity

Key producer % share of Jan-Sep 2009 world aluminium output

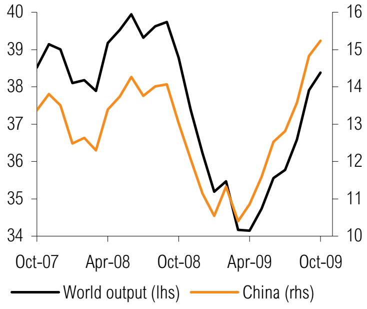


Source: IAI and WBMS

It now looks like world refined aluminium output will fall 6.5% in 2009 to 37.50mt. Hard hit has been Europe, down 16% yoy, hurt by the strong euro and onerous power costs. The European Aluminium Association in December noted that "a substantial fraction (66%) of the European smelting industry is seriously endangered in the near future as their long term electricity supply contracts end." Western European aluminium production in 2009 was about 5mt, or 15% of world supply. We expect European output (including Russia) to slide a further hefty 8%, or 0.650mt, in 2010 to 7.50mt, and stagnate at that level in 2011. We estimate that at their peak, world cutbacks totalled c7mtpa, or 18% of world supply. About half of that capacity, mostly Chinese, has now been reactivated. This is a positive, in our view, as aluminium no longer has the magnitude of reactivation potential and production overhang that faces for example, nickel.

Aluminium is the only base metal still trading below what we consider its long-term inducement price (US$2,425/tonne) and not until H211F do we expect prices to sustain levels above this key marker. Our supply/demand outlook shows that two consecutive years of above 4% pa world GDP growth will generate over 8% pa aluminium demand growth. This should first stall and then see contraction of inventory levels of aluminium, translating into prices well above US$2,000/tonne in 2010 and 2011. This is likely to lead to a mix of further price and demand-induced reactivation. We forecast world primary aluminium supply will rise by 4%, or 1.5mt, in 2010 to 39mt, accelerating to a compound growth through to 2013F of over 6% pa, setting fresh annual output records.

Rebound in Chinese output drives up world aluminium output (mt)



Source: RBS

Chinese reactivations lift China's output rate to record high

The latest monthly production report from the International Aluminium Institute (IAI) shows that its members, including China, produced 29.81mt of metal in January-October 2009, 8.6% or 2.80mt less than the comparable 2008 period. However, this masks the fact that world output, due mainly to Chinese smelter reactivation, has already embarked upon a sharp upward trajectory. World output hit a 30-month low rate of output in April 2009 of 34.14mtpa, but by October had risen by 12.5%, or 4.25mtpa, to 38.39mtpa.

China's aluminium smelters dominate the world aluminium industry, with more smelters in China than in the rest of the world combined. China now accounts for a record 35% of world refined aluminium production. As our table below shows, yoy Chinese production growth accelerated from 20% in 2006 to a record 35% in 2007, then as a result of poor demand and price cutbacks, a meagre 4% in 2008. Data from the IAI for October shows that in January-October, China produced 10.306mt, down 0.862mt yoy, a nearly 8% yoy decline.

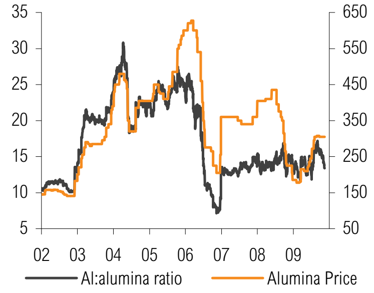
But China has adopted a completely different production strategy to the rest of the world. Since China's March 2009 production low of 10.397mtpa, reactivation has seen mom output rises without pause. Output has now risen by 47% since the March 2009 low, representing an annualised 4.84mtpa of new and reactivated production. We estimate that 75% of the capacity China closed down has now been reactivated, which contrasts with less than 10% reactivation of shuttered capacity elsewhere in the world.

Chinese cutbacks in 2008 reduced output growth to just 4% yoy. Cutbacks have been rapidly reversed and a strong rebound is under way

mt	2002	2003	2004	2005	2006	2007	2008	10M 08	10M 09
Primary production	4.321	5.547	6.689	7.806	9.349	12.588	13.105	11.168	10.306
Change	0.950	1.226	1.142	1.117	1.543	3.239	0.517		-0.862
Change yoy	28%	28%	21%	17%	20%	35%	4%		-7.7%

Source: International Aluminium Institute

Aluminium restarts have boosted the alumina price (RHS US$/tonne)



Source: Bloomberg and RBS

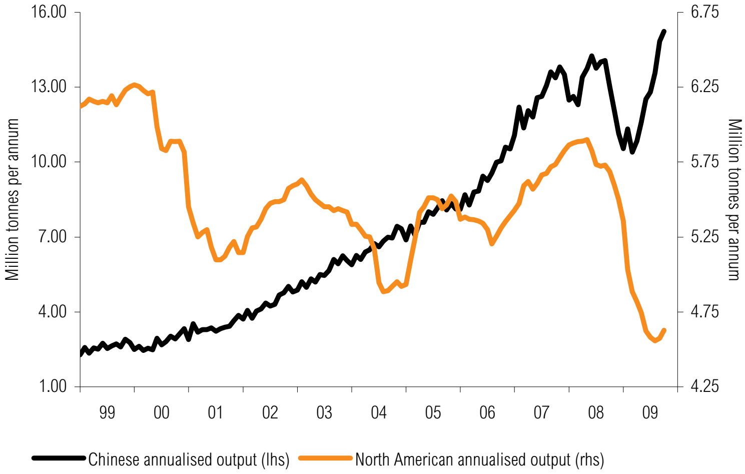
Alumina is the feedstock for producing aluminium, and Chinese aluminium smelter restarts have boosted world alumina demand. Domestic Chinese refinery output has also risen sharply, hitting a record high in September of 27mtpa. However, even these alumina restarts have not been enough and alumina imports into China have risen sharply. Chinese monthly customs data show that in January-October 2009, Chinese alumina imports were up 20% yoy at 4.511mt, an additional 0.737mt. The alumina price has outperformed aluminium this year, rising over 70% from an April 2009 low of US$178/tonne to US$305/tonne.

We mentioned earlier the diametrically opposed output strategies of China (35% of world output) and North America (13% of world output). The chart below shows production data for these two Goliaths, with Chinese output now comfortably at record levels and North America just starting to tick up.

But aluminium is all about energy. Reducing the stable alumina oxide to aluminium metal is a highly energy-intensive process, accounting for about 40% of the cost of production. We maintain that the higher marginal cost of Chinese energy still makes it likely that its smelting industry will remain at the upper end, very much the wrong end of the aluminium production cost curve.

Looking at current operating rates and future capacity plans, we forecast that Chinese aluminium output will contract by 5% in 2009 to 13mt, but will rebound by a notable 27% yoy in 2011. Unrelenting pressure from China.

China and North America account for 50% of world aluminium output. China has not waited for demand recovery, but is already reactivating.



Source: IAI and RBS

Outlook – reduced supply surplus, but still a slog

Nickel has now replaced aluminium as the metal with the weakest market outlook. But let there be no mistake, aluminium is very much still in the doldrums. Yes, the light metal has in our opinion now passed the point of maximum despair in terms of both price and market fundamentals, but there is much to be done to erode the supply surplus and return the market to equilibrium. The focus is now very much the forecast upturn in the world business cycle in 2010-11F. Many governments have declared their economies to be out of technical recession. We also expect China, the biggest aluminium consumer, to register GDP growth of over 9% pa in both 2010 and 2011. So what are the positives for aluminium that may offset some of the upcoming macro headwinds?

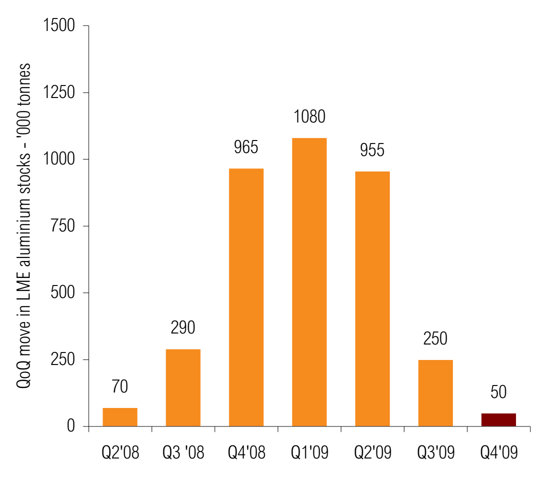
EAA warns of widespread European aluminium smelter closures – The strength of the euro has been a hammer blow for higher cost European aluminium producers. The European Aluminium Association (EAA) has warned that due to some of the world's highest power costs, up to 66% of European aluminium smelting capacity could be forced to close. Already smelters such as **Steg; Auzat; Lannemezan** and **Anglesey** have closed when power supply contract renewal proved too onerous. We can likely add to this list Alcoa's two Italian smelters at **Porto Vesme** and **Fusina**, where Alcoa has been ordered to pay back state aid and may permanently close the plants, and Germany's largest smelter, Norsk Hydro's 0.230mtpa **Neuss** smelter, may also face closure.

IAI producer and Japanese port stocks at record lows – Japanese port stocks of aluminium at 0.171mt and IAI world producer inventory at 1.207mt are close to the lowest levels since records began. We see ample opportunity for restocking when the nature of the 2010 rebound in world aluminium is established.

Aluminium ETF and Rusal Glencore wild cards – We still await fresh details on the aluminium lock-up deal between Russian aluminium producer US Rusal and Glencore. Glencore has agreed to buy 1.30mt of aluminium from UC Rusal, about 3.5% of world production. In a further initiative, Metal Bulletin cites that Glencore was in discussions with a finance house to create the world's first physically backed Exchange Traded Fund (ETF) in aluminium.

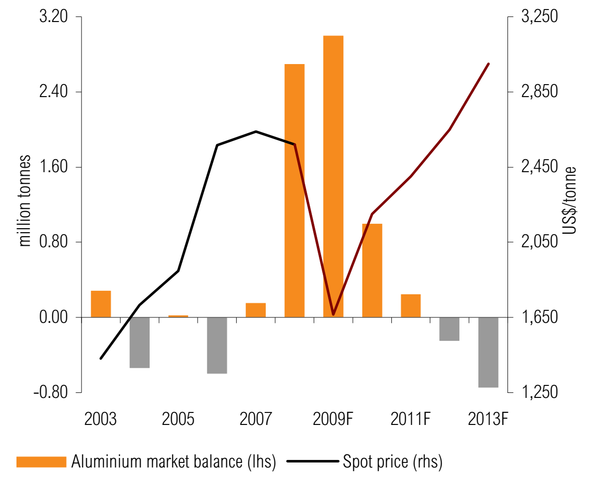
Pace of exchange inventory build has slowed markedly – The LME and SHFE are the main exchanges for trading aluminium. The left-hand chart below shows the rate of change in combined LME and SHFE aluminium inventory build over the past 18 months. As the recession had an impact and demand slumped, inventory accretion rose very sharply, from 0.290mt in Q3 08 to around 1mt in each of the quarters through to Q2 09. But net inventory build in Q3 09 was just 0.250mt and thus far this quarter a meagre 0.050mt. We also note that LME warehouses are reporting a higher level of cancelled warrants. At end-2008, cancelled warrants were just 0.5% and have now risen to 3.5% – the highest of any of the LME metals (even copper is just 0.3%, having been at over 20% earlier this year) Just think of the inventory drawdown potential for aluminium when real demand growth gets into its stride in 2010.

Quarterly moves in combined LME & SHFE aluminium inventory. Good news. Stock build markedly lower.



Source: LME, SHFE and RBS

World aluminium supply/demand surplus and deficits, 2003-13F. Supply surplus to decline and price to rise



Source: CRU, LME and RBS forecasts

In the above chart, we show the historical and forecast world aluminium supply-demand balance. We still forecast that the aluminium market will remain in surplus for two more years, and that over the five-year period between 2007 and 2011F, the cumulative supply surplus will have totalled an onerous 7.10mt.

In every previous recovery from economic recession, aluminium has shown strong above-trend demand growth into the recovery. This relentless real demand growth, not just China but also from mature OECD economies, will likely rapidly diminish the scale of supply surpluses post 2009. Indeed, we forecast a 66% decline in the supply surplus in 2010 to 1mt. Already the financial community has been attracted by the slowing pace of build in reported inventory and the now favourable risk/reward of aluminium against its more high-flying cousins. Post 2011, as supply shortfalls re-emerge and the headwinds abate, we forecast even more acute pricing tension will return.

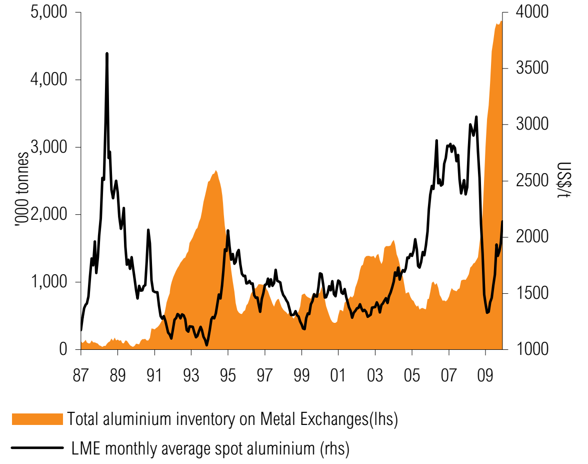
In the charts below, we have shown exchange stocks of aluminium in absolute terms, but also total reported stocks expressed in terms of a stock: consumption ratio. We forecast total reported inventories at end-2009 will exceed 6.60mt, equivalent to 19% of 2009 world consumption. By 2013F, we think that inventory will have been eroded to about 13% of world demand. We estimate that the aluminium stock ratio will hold at 10 weeks of stock through to end-2010 – the highest stock ratio in 15 years. For sustained profitability to return to the industry, we believe this ratio needs to be halved to five weeks of stock, requiring the erosion of 3mt of metal – a tall, but not unrealistic order, but not before end-2013.

Modest, defensive price progression in 2010; fireworks post 2011

The aluminium price has done very well to comfortably absorb the reactivation of about 50% of its idled capacity. But the price is still about 10% below what we consider a long-term sustainable price for the metal of US$2,425/tonne (US$1.10/lb). We have been encouraged by aluminium's price progression since our last review and have firmed up our price profile. It now looks as if 2009's spot price average of US$1,665/tonne (US$0.75/lb) will represent a 35% yoy price decline. However, the spot price is ending 2009 at 14-month highs and we have increased our 2010 spot average by 11%, to US$2,200/tonne and by 10% in 2011 to US$2,400/tonne.

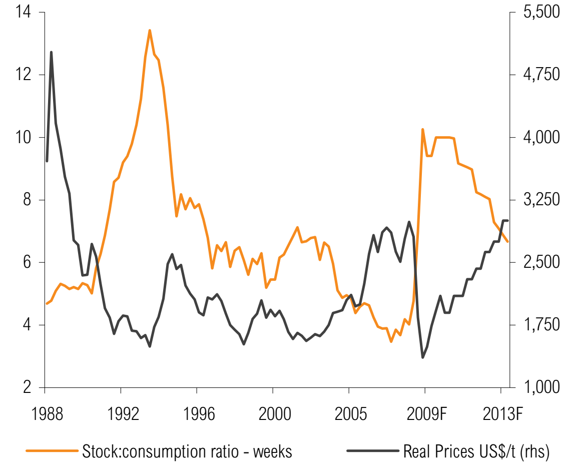
We continue to expect the positive theme of a reducing supply surplus as real demand recovers battling against broader market headwinds. Greater pricing tension should arise in 2012, with the emergence of the first supply deficit in five years. By 2013, we forecast a deep inventory draining supply shortfall of 0.750mt will see an aluminium price average more than 80% higher than in 2009, at US$3,000/tonne (US$1.35/lb).

Total exchange stocks of aluminium at record highs. Aluminium price already anticipating erosion in 2010



Source: LME, SHFE and RBS

Aluminium stock:consumption ratio vs real price. Now at 10 weeks, we forecast decline to 6.5 by 2013F



Source: IAI, WBMS, LME, SHFE and RBS

Selected price-related production cutbacks in the aluminium industry since mid-2008

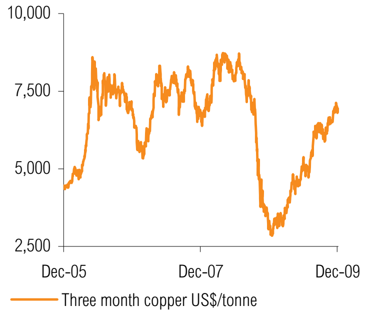
Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Alumina refineries			
Shandong, Weiqiao, China	Implemented September 2008	Cut 2mt/y of 4mt/y capacity	
Shandong, Lubei, China	Announced October 2008	To close 1mt/y refinery	
Point Comfort, Alcoa, US	Implemented November 2008	Cut by 550kt/y	
Zaporozhye, Rusal, Ukraine	Announced November 2008/March 2009	Unspecified cut at 265kt/y plant	
Chalco, China	Announced November 2008/March 2009	Closing ~4.3mt/y of cap. (39% of total)	Back up to 100% cap. util. by Dec 09
Alcoa	Implemented November 2008	Unspecified cuts of ~700kt/y	Believed to be in addition to Pt. Comfort
Podgorica, KAP, Montenegro	Announced November 2008	Unspecified cut at 280kt/y plant	
Eurallumina, RUSAL/Glencore, Italy	Announced December 2008/February 2009	Cut by 50%, then to close 1.1mt/y plant	
Ewarton/Kirkvine, Windalco (RUSAL), Jamaica	Announced December 2008/February 2009	To cut by 35% of combined cap., then close	Combined capacity 1.3mt/y
Henan Wanji, China	Announced January/April 2009	Cut to 50% at 800kt/y plant, then up to 80%	
Alcoa	Announced January 2009	Unspecified cut of a further ~250kt/y	
Nain, Alpart, Jamaica	Announced January/March 2009	To cut by 50%, then close 1.65mt/y plant	
Vaudreuil, Rio Tinto Alcan, Canada	Announced January 2009	To cut by 25%, or 400kt/y	Back to full capacity September 2009
Gardanne, Rio Tinto Alcan, France	Announced January 2009	To cut by 15%, or ~105kt/y	
Aughinish, RUSAL/Glencore, Ireland	Announced February 2009	To cut by 37% at 2mt/y plant	
Gramercy, Noranda Al, US	Announced Q1 09	Cut by 50% at 1.2mt/y plant	Back to full production Q4 09
Birac, Bosnia	Announced April 2009	Cut from 300kt/y to 120kt/y	Back up to 300kt/y October 2009
Corpus Christi, Sherwin Alumina, US	Implemented April 2009	Cut 40% of 1.4mt/y metallurgical capacity	
Paranam, Suralco (Alcoa), Surinam	Announced May 2009	To cut by ~40% at 2.2mt/y plant	
Friguia, RUSAL, Guinea	Announced June 2009	To cut by ~385kt/y at 850kt/y plant	For one month, back to normal Aug 09
Aluminium smelters			
Columbia Falls, Glencore, US	Implemented July 2008/January 2009	Closed $1^1/_2$ of 2 potlines at 168kt/y plant	Other three potlines already closed
Sichuan Aostar, China	Implemented September/December 2008	Cut by 40kt/y, then total of 250kt/y	But began full restart in March 2009
Puerto Ordaz, Alcasa, Venezuela	Implemented September 2008/February 2009	Cumulatively cut to 75% of 210kt/y capacity	But has rarely produced at capacity
Rockdale, Alcoa, US	Implemented June, October 2008	Cut by 120kt/y, closure of rest (145kt/y)	
Vimetco, China	Implemented October 2008/January 2009	Cut in stages by 145kt/y	
Emeishan Aluminium, China	Implemented October 2008	Has cut by 50kt/y of 150kt/y	
Zhongfu, China		Has cut 50kt/y of 300kt/y plant	
Longquan Aluminium, China		Has cut 40kt/y of 600 kt/y	
HMHJ Aluminium, China		Has cut ~30kt/y of 300kt/y	
Shandong, Chalco, China		To close 70kt/y plant	
Zhengzhou, Chalco, China		To cut 40kt/y of 60kt/y plant	
Yunnan Aluminium, China		To cut by 10-15% of 400kt/y capacity	
Rio Tinto Alcan, Norway/UK	Announced October/December 2008	Cuts across various smelters of ~150kt/y	60kt UK, 90kt Norway
Dunkirk/St Jean, Rio Tinto Alcan, France	Announced November 2008	Cut of 29kt/y Dunkirk, 23kt/y St Jean	Dunkirk cut to be reversed by June 2009
Chalco, China	Announced October 2008/March 2009	Cut by ~950kt/y across company	Back up to 100% cap. util. by Dec 09
Sepetiba Bay, Valesul (Vale), Brazil	Announced October 2008	To cut by ~57kt/y of 95kt/y	
Zaporozhye, RUSAL, Ukraine	Announced November 2008/March 2009	Closing 3 of 4 potlines at 115kt/y plant	
Alcoa, incl. Ferndale, US, Baie Comeau, Canada	Implemented November 2008	Cuts amounting to 350kt/y	
Ningxia Qinyi Zhongning, Rio Tinto Alcan, China	Implemented November 2008	Unspecified cuts at 150kt/y smelter	
Karmoy, Hydro Aluminium, Norway	Implemented/announced December 2008	To cut by 24kt/y at 120kt/y line	Then to close in Q1 09 instead of end 09
Aluminij Mostar, Bosnia	Announced November/December 2008	To cut by 25% at 140kt/y plant	Started to return to full cap. Sept 09
Podgorica, KAP, Montenegro	Announced November 2008	To cut by 60-65kt/y of 125kt/y	
Mettur, Malco (Vedanta), India	Implemented November/December 2008	Cut 40kt/y plant by 60%, then close	
Konin, Impexmetal, Poland	Announced November 2008	To close 55kt/y plant in H1 09	
Essen, Trimet, Germany	Implemented November 2008/January 2009	Closed 1 then 2 of 3 lines at 170kt/y plant	But partial restart May 2009
Portland, Alcoa, Australia	Implemented December 2008/April 2009	Cut by 15kt/y then to 53kt/y at 358kt/y plant	
Danjiangkou, China	Implemented December 2008/February 2009	Cut by 30kt/y at 120kt/y plant	
Husnes, Soral (Hydro/Rio Tinto Alcan), Norway	Announced December 2008/February 2009	Cutting in two stages to 50% of capacity	Capacity 173kt/y
Bogoslovsk/Uralsky, RUSAL, Russia	Announced December 2008	To cut by 180kt/y	Combined cap. 325kt/y, cuts mainly here
Tursunzade, Talco, Tajikistan	Announced December 2008/April 2009	Cut by ~25%, ~100kt/y at least in Q1 09	Started raising output July, full end 09
Ravenswood, Century Aluminium, US	Implemented December 2008/February 2009	Cut by 42kt/y, the closed 170kt/y plant	
Slatina, Vimetco, Romania	Implemented January/February 2009	Cut in two stages by 65kt/y of 270kt/y	
Alcoa Tennessee, Alcoa, US	Announced January 2009	To close 220kt/y plant	~85kt/y had already been cut
Shanxi Guanlu, China	Announced January 2009	To cut 40kt/y at 110kt/y plant	Restarted October 2009
Holyhead, Rio Tinto Alcan/Kaiser, UK	Announced January/August 2009	To close 145kt/y plant in Sept. 2009	Permanent closure
Beauharnois, Rio Tinto Alcan, Canada	Announced January 2009	To close 52kt/y plant in Q2 09	
Korba, Balco (Vedanta), India	Implemented January 2009	Cut of ~20% at 110kt/y line	
Neuss (Norf), Norsk Hydro, Germany	Announced January/April 2009	Gradual cut to 21% of 230 kt/y capacity	State aid plan to reverse H2 09 closure
RUSAL, Russia	Announced February 2009	To cut by further 320k/y	At unspecified plants in Russia
Essen, Hamburg, Trimet, Germany	Implemented February 2009	Cut of 30% at 130kt/y plant	Early 2010 restarting ~57k
Hawesville, Century Aluminium, US	Implemented March/May 2009	Cut one 52kt/y potline, then ~14kt/y at	Five potlines, combined capacity 250kt/y
Guangxi Yinhai, China	Implemented March 2009	Cut by ~33% of 250kt/y capacity	Back to full production by October 2009
Sunndal, Hydro Aluminium, Norway	Announced March 2009	To cut by 25% at 400kt/y plant	
Massena East, Alcoa, US	Announced March 2009	To cut by 120kt/y	
Novokuznetsk, RUSAL, Russia	Implemented April 2009	Cutting by 33% at 320kt/y plant	
San Ciprian/Aviles/La Coruna, Alcoa, Spain	Announced May 2009	Cut by 18% of combined capacity 408kt/y	Implemented in Q1 09
Hannibal, Ormet, US	Implemented May/August 2009	Closed 1 then 2 of 6 lines at 270kt/y plant	Alumina dispute with Glencore
Fusina/Porto Vesme, Alcoa, Italy	Announced November 2009	To close Dec 09, combined cap. 195kt/y	Forced to pay back state aid
Estimated unidentified cuts, mainly in China		~1,750kt/y	But 4mt/y + restarts in China

Source: Company reports, Reuters, Bloomberg, RBS

Copper

Still our favourite base metal

Copper price up 155% at best, recouping 70% of previous losses



Source: LME

Copper remains our most favoured base metal. It may not see the greatest price gains from current levels, but it is still the most likely to hit a new record high and should be well ahead of the pack in this. Copper may not have the best demand prospects, but we believe copper producers will have the most difficulty keeping up with demand when the economic cycle is in full swing. We forecast that the copper market will be back in deficit by 2011 and although it may still not be as tight by 2013 as it was in 2005-08, we think such is very possible by 2014-15.

The marketplace seems to share our medium-term view. But it may have got ahead of itself, for copper still has work to do before conditions begin to tighten. We estimate an underlying surplus over 2008-09 of 1.3mt albeit masked by perhaps 1.1mt of stockpiling in China, and expect another surplus in 2010 even on our conservative production forecasts. The reported stocks to consumption ratio may therefore climb further in 2010, though not to the excessive levels seen elsewhere. This, coupled with wider headwinds that metals may face, suggests the copper price will come under some downward pressure before it resumes its upward march to a forecast average price of fully US$9,500/t in 2013.

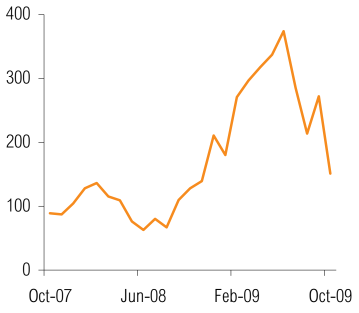
RBS world copper supply/demand balance, 2006-13F – hefty 0.9mt surplus in 2009, but supply deficits from 2011

(m tonnes)	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**
World copper mine production	**14.96**	**15.50**	**15.53**	**15.65**	**15.85**	**16.60**	**17.40**	**18.05**
% change	**0.2%**	**3.6%**	**0.2%**	**0.8%**	**1.3%**	**4.7%**	**4.8%**	**3.7%**
of which South America	6.74	7.15	6.94	6.80	7.30	7.55	8.05	8.30
Change %	0.8%	6.1%	-3.0%	-2.0%	7.4%	3.4%	6.6%	3.1%
of which Asia (including China)	2.77	2.86	2.93	3.30	3.40	3.45	3.55	3.80
Change %	-3.3%	3.2%	2.4%	12.6%	3.0%	1.5%	2.9%	7.0%
Disruption allowance & market adjustment				0.10	1.00	1.05	1.10	1.15
World refined copper production	**17.22**	**17.95**	**18.10**	**17.55**	**17.90**	**18.80**	**19.70**	**20.45**
% change	**4.2%**	**4.3%**	**0.9%**	**-3.1%**	**2.0%**	**5.0%**	**4.8%**	**3.8%**
of which China	3.00	3.50	3.76	3.95	4.35	4.75	5.10	5.55
% Change	14.4%	16.7%	7.5%	5.1%	10.1%	9.2%	7.4%	8.8%
of which South America	3.60	3.67	3.73	3.85	4.00	4.05	4.15	4.15
% change	0.3%	1.9%	1.7%	3.3%	3.9%	1.3%	2.5%	0.0%
Disruption allowance & market adjustment				0.15	1.10	1.10	1.15	1.20
World refined copper consumption	**17.37**	**18.03**	**17.72**	**16.65**	**17.70**	**18.90**	**19.85**	**20.80**
Change (%)	**3.2%**	**3.8%**	**-1.7%**	**-6.0%**	**6.3%**	**6.8%**	**5.0%**	**4.8%**
of which China	4.00	4.66	4.89	5.90	6.45	7.05	7.60	8.20
% change	4.9%	16.5%	5.0%	20.7%	9.3%	9.3%	7.8%	7.9%
of which total Asia	8.75	9.61	9.80	10.28	11.10	11.95	12.70	13.45
% change	3.7%	9.9%	1.9%	4.9%	8.0%	7.7%	6.3%	5.9%
of which Europe	4.99	4.81	4.54	3.50	3.60	3.75	3.85	3.95
% change	8.0%	-3.7%	-5.6%	-22.9%	2.9%	4.2%	2.7%	2.6%
of which North America	2.69	2.65	2.38	1.93	2.00	2.10	2.15	2.18
% change	-7.1%	-1.6%	-10.1%	-19.1%	3.9%	5.0%	2.4%	1.2%
Implied market balance	**-0.15**	**-0.08**	**0.38**	**0.90**	**0.20**	**-0.10**	**-0.15**	**-0.35**
Actual/forecast reported stocks	1.13	1.02	1.15	1.35	1.70	1.70	1.60	1.40
Reported stock change	0.26	-0.11	0.13	0.20	0.35	0.00	-0.10	-0.20
Stock: consumption ratio (weeks)	**3.4**	**2.9**	**3.4**	**4.2**	**5.0**	**4.7**	**4.2**	**3.5**
LME spot price (US$/tonne)	**6,729**	**7,125**	**6,951**	**5,145**	**6,750**	**7,500**	**8,250**	**9,500**
LME spot copper price US¢/lb	**305**	**323**	**315**	**233**	**305**	**340**	**375**	**430**
Change (%)	**83%**	**6%**	**-2%**	**-26%**	**31%**	**11%**	**10%**	**15%**

Source: CRU, ICSG, RBS estimates and forecasts

Demand – focus shifting from apparent to real

Chinese net imports of refined copper (000t) well down from peak



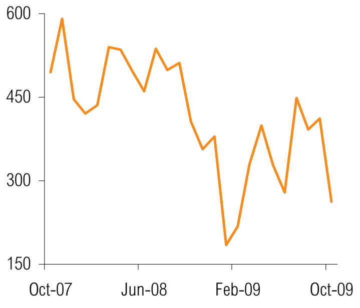
Source: Chinese Gen Admin of Customs, RBS

Demand is taking longer than expected to get back into its stride, but we have left unchanged at 6% our estimate of the decline in real world demand for refined copper in 2009. Though less precipitous than that of some metals, this has taken demand all the way back to the level of 2004. But the contrasts between the first and second halves and between China and the rest of the world are vast. We estimate that demand plunged by 9-10% yoy in H1 09, comprising a 20% surge in China and a 20% collapse elsewhere, but that it has stabilised in H2 at down 2-3% as the fall ex-China has eased to ‘only’ 11-12%. Our estimates differ sharply from those of the WBMS, which has global demand up 1% yoy in Q1-Q3 2009 due to explosive growth in China of over 45%. But the WBMS does not allow for Chinese stockpiling activity (ditto the ICSG with similar estimates).

Chinese stockpiling may have continued into H2 09

Whichever of the available production series is used, a simple calculation that also factors in the near tripling of imports to 2.5mt (plus small changes in SHFE stocks) points to growth in Chinese apparent demand for refined copper of at least 45% yoy in Q1-Q3 09. Chinese refined demand has been greatly boosted by a plunge in the availability and imports of direct use scrap (scrap needing refining is first a supply side item), but this figure still does not look credible as a measure of real demand. Based on our estimates of real Chinese refined demand, we conclude that there was a build-up of copper stocks in China over the four quarters to Q3 09 of about 1.1mt. The reported purchase of 235kt by China’s State Reserves Bureau (SRB) accounted for little more than 20% of this. Some of the rest could have been genuine consumer restocking, but much may have been more speculative hoarding by consumers, traders and others.

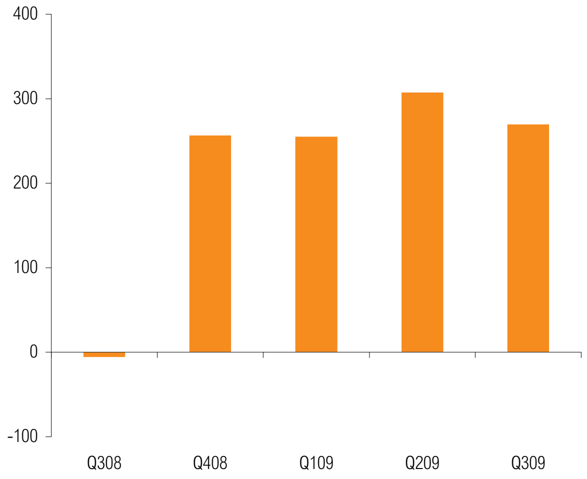
Chinese imports of copper scrap (000t) down sharply in 2009



Source: Chinese Gen Admin of Customs, RBS

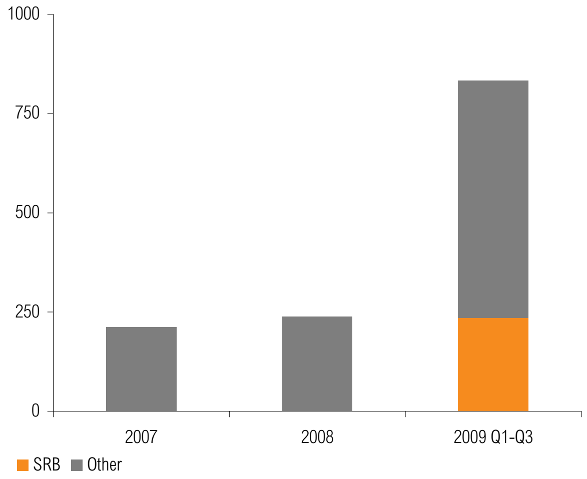
The timing of the SRB’s purchase may have been opportunistic, but the strategic stockpile of copper, of which China is structurally short, needed replenishment following big releases in 2004-06. We expect the SRB to hold onto its now larger stockpile, perhaps selling only in an emergency. But much of the material in other Chinese stockpiles may find its way back into the market in the coming years. In the shorter term, Chinese imports of refined copper are likely to continue to decline from their June 2009 peak, especially as the LME-SHFE price differential has for some months been such as to make them unprofitable.

Implied build-up of off-market stocks of refined copper in China – perhaps 1.1mt over Q408 to Q309



Source: CRU, Chinese General Administration of Customs, RBS

Implied build-up of off-market stocks of refined copper in China – much in addition to SRB buying

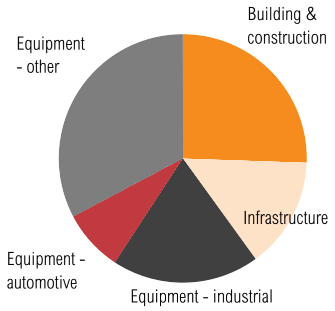


Source: CRU, Chinese General Administration of Customs, RBS

Solid cyclical recovery, but substitution pressure could resurface

Returning to real copper demand, although there have been signs of stabilisation in recent months, little pickup is yet in evidence. We estimate that global demand has been barely more than flat yoy in Q4 09, despite favourable base effects (the total slid 8-9% in Q4 08), with China still up 20% and the rest of the world down 7-8%. Nevertheless, we believe the scene is now set for a strong recovery in 2010. First, RBS now forecasts world economic growth of over 4%, and it is likely that metals-intensive sectors will be at the forefront of this. Some industries, such as automobiles, may remain relatively weak, but copper-intensive infrastructure building should again be a bright spot. Second, favourable base effects should finally kick in. There is certainly much lost ground to be made up; non-Chinese demand was down perhaps 20% between 2007 and 2009.

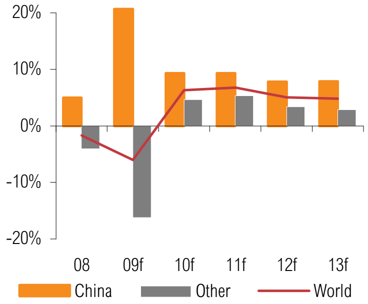
World copper demand by final market – well spread



Source: ICSG, RBS

We forecast that real world refined copper demand will recover by 6-7% in 2010, although apparent demand growth is likely to be slower. Chinese growth should come off the boil following the surge fuelled by the shortage of direct scrap, but the swing ex-China may be from minus 16% to plus 5%. Yet this would leave global demand still a little shy of its 2007 level and non-Chinese offtake fully 15% short, which suggests there will be ample scope for further above-trend growth in 2011. We forecast world growth in 2011 of close to 7%.

World refined copper demand may bounce by 6-7% in 2010 and 2011



Source: CRU, RBS forecasts

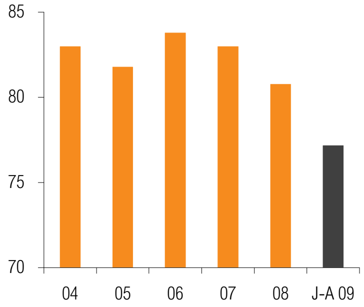
We must, however, disentangle cyclical factors and structural trends. First, the weak trend in non-Chinese and especially developed world copper demand has been largely due to the migration of basic manufacturing to China. This is likely to continue. More importantly, despite persistent commentary about how strong structurally the market for copper is, the global CAGR between 2001 and 2007 was less than 4% pa, no faster than lead and zinc, and slower than copper achieved in previous, less economically spirited cycles. This was partly due to substitution as the copper price soared far beyond that of competing materials, but we expect pressure here to intensify again in the years ahead. We reiterate our advice to consumers to redouble their efforts to substitute away from copper.

We expect world copper demand growth to slow to about 5% pa in 2012-13. This would still leave the CAGR between 2009 and 2013 close to 6% pa, which may look on the high side given our observations above. But it largely reflects the fact that the trough of 2009 has been deeper than that of 2001 and even that of 1982. Our forecasts have Chinese growth slowing to 8-9% pa over the period and non-Chinese demand still well below its 2007 peak even in 2013.

Supply side constraints to return to the fore

As before, the reason we believe substitution pressures will intensify again in the coming years is not so much the inherent strength of demand as the difficulty producers may again have in keeping up with growth. Copper remains primarily a supply side story and this partly explains the speed and extent of the price recovery in 2009, despite weak real demand and a large underlying surplus.

Copper refinery capacity utilisation (%) very low in 2009 at just 77%



Source: ICSG, RBS

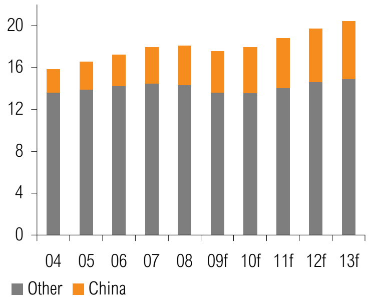
The supply issues mainly concern mines rather than smelters and refineries, where capacity is and will, in our view, remain ample. World copper refinery capacity utilisation dropped to a record low 77% in January-August 2009, according to ICSG data albeit due largely to smelter cutbacks that at their height amounted to an estimated 9% of 2008 world production. We estimate that global refined output will have fallen by about 3% in 2009. Capacity utilisation could readily be ramped back up to at least the levels of 2004-07, were wider market conditions to allow. Moreover, world smelter capacity looks set to rise steadily in the coming years. China has plans for at least 2mtpa of new plant in 2010-13, although additions elsewhere will be limited and largely offset by closures (notably in Canada) as smelters struggle to compete with China.

Selected price-related production cutbacks in the copper industry since mid-2008; reactivations highlighted in red

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Mines			
Bagdad/Miami/Sierrita, Freeport, US	Announced October 2008	To delay Miami restart	And defer expansions at Bagdad/Sierrita
Tsumeb et al, Weatherly Intl., Namibia	Implemented November/December 2008	Closed all four mines by end 2008	In Nov 09 planning to restart some or all
Mukondo/Kakanda/Luita, CAMEC, DR Congo	Implemented November 2008	All closed, 07/08 production 30kt	Luita restarted April 2009
Tilwezembe, Katanga Mining, DR Congo	Implemented November 2008	Closed, production ~5kt/y	
Trojan/Shangani, Bindura Nickel, Zimbabwe	Implemented November 2008	Closed, combined capacity ~4kt/y	
Myra Falls, Breakwater Resources, Canada	Announced November 2008	Was to close ~13kt/y mine but revoked	
Langlois, Breakwater Resources, Canada	Implemented November 2008	Closure of ~4kt/y mine	
Aljustrel, Lundin Mining, Portugal	Implemented November 2008	Closure, was to build up to 3kt/y	
Tritton, Straits Resources, Australia	Announced November 2008	Was to produce 35kt in 09, now 25kt	
Craig/Thayer-Lindsley, Xstrata, Canada	Announced November 2008/February 2009	To close both mines early, Feb 2009	Combined capacity was ~15kt/y
Copper Cliff South, Vale, Canada	Announced December 2008	To close ~10kt/y mine	
Voisey's Bay, Vale, Canada	Announced December 2008	To close for one month in July 2009	Loss, ~3kt
Four mines in Peru/Chile, Freeport	Announced December 2008/January 2009	Cuts and deferral of expansions	Combined 2010 prod ~90kt less
Chino/Morenci/Safford/Tyrone, Freeport, US	Announced December 2008/January 2009	To close Chino, 50% cutbacks at others	Combined cut 180kt in 09, 270kt in 2010
Chambishi, CNNC, Zambia	Implemented December 2008	Closed 50kt/y operations	
Dikulushi, Anvil Mining, DR Congo	Implemented December 2008	Closed mine that was expanding to 15kt/y	
Baluba, Luanshya Copper Mines, Zambia	Implemented December 2008	Closed 35kt/y mine	CNMC to restart December 2009
RZB Bucim, Macedonia	Announced January 2009	To close ~9kt/y mine	
Mowana, African Copper, Botswana	Implemented January 2009	Closed 20kt/y mine	Restart September 2009
Lince, Antofagasta, Chile	Announced January 2009	To close open-pit section, loss ~7kt/y	
Pinto Valley, BHP Billiton, US	Announced January 2009	To close ~60kt/y concentrate mine Feb 09	
Kazakhmys, Kazakhstan	Announced January 2009	To cut 2009 output by 10-15% from 371kt	
Fraser/Fraser Morgan, Xstrata, Canada	Announced February 2009	To close ~9kt/yFraser, defer Fraser Morgan	
Mufulira, Mopani Copper Mines, Zambia	Announced March/April 009	Wanted to close 90kt/y conc. + SX-EW mine	But decision reversed
Nkana, Mopani Copper Mines, Zambia	Announced March/April 2009	Wanted to close 120kt/y conc. + SX-EW mine	But decision reversed
Sudbury operations, Vale, Canada	Announced April 2009	To close 90kt/y for 8 weeks in Q2/Q3 2009	In addition to maintenance closure in May
Smelters/refineries			
Shandong Jinsheng, China	Implemented September 2008	Closed 80kt/y plant	
Ningbo Jintian, China	Implemented October 2008/March 2009	Cut to 90kt/y from ~180kt/y	
Tongling NFM, China	Announced October 2008	Cut may be 10-20% of 650kt/y capacity	
Daye NF, China	Implemented November 2008	To cut 10% of 280kt/y	
Kyshtym/Novgorod, Russian Copper, Russia		Cut by ~45kt/y in 2008	
Jintian, China		Cutting >90% of 200kt/y	
Fuchunjiang, China		Cutting 33% of 120kt/y	
Yantai Penghui, China		Cutting 25% of 100kt/y	
Shanghai Xinye, China		Cutting 15-20% of 60kt/y	
Khetri, Hindustan Copper, India	Implemented December 2008	Closed 31kt/y plant	
Pan Pacific Copper (Nippon/Mitsui), Japan	Announced December 2008/March 2009	Cut by 10% of 610kt/y capacity	Until at least September 2009
Toyo, Sumitomo, Japan	Announced January 2009	Cut by 7% at 450kt/y plant	
Onsan, LS-Nikko, South Korea	Announced January 2009	Cut by 10% of 570kt/y, ~55kt/y	
Naoshima/Onahama, Mitsubishi, Japan	Announced January 2009	To cut both by 10%, ~50kt/y	Back at full capacity August 2009
Gresik, Mitsubishi, Indonesia	Announced January 2009	To cut by 10% at 275kt/y plant	
Kazakhmys, Kazakhstan	Announced January 2009	To cut 2009 output by 10-15% from 340kt	
Harjavalta/Ronnskar, Boliden, Finland/Sweden	Announced January 2009	Cut by combined annualised 68kt/y in Q1 09	
Yunnan Copper, China	Announced February 2009	To produce 35kt less in 2009 than in 2008	Had already cut output in 2008
Hayden/Amarillo, Asarco, US	Announced March 2009	Smelter maintenance closure in Q2 09	Small cuts at refinery, prod <180kt/y
La Oroya, Doe Run, Peru	Implemented March/June 2009	Forced to cut then close 55kt/y plant	Due to financial/environmental problems
Tamano JV, Japan	Announced April 2009	Cut by 21% in H1 09/10 at 260kt/y plant	
Copper Cliff, Vale, Canada	Announced April 2009	To close 120kt/y for 8 weeks in Q2/Q3 2009	In addition to maintenance closure in May
Kidd Creek, Xstrata, Canada	Announced April/August 2009	Closed ~135kt/y plant for 15-18 weeks in 09	To close permanently May 2010

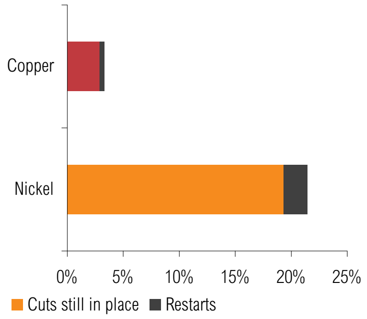
Source: Company reports, Reuters, Bloomberg, RBS

World refined copper output (mt), 2004-13f – China crowding out



Source: CRU, RBS forecasts

Mine cuts/restarts as % of world output – little action in copper



Source: RBS

Much of the decline in refined copper production in 2009 has come from a decrease in the processing of secondary material; the ICSG estimates a drop in world secondary refined output in Jan-Aug 2009 of 3% yoy. This is partly due to the cutbacks, but in addition, less scrap feed has been available. Availability should improve as economic activity picks up and we expect a secular uptrend as industrialisation broadens and deepens among developing nations. So we come back again to whether there will be sufficient mined copper.

Potential growth in copper mine production can be put into three broad categories: 1) reactivation of capacity closed in late 2008 and 2009 in response to poor market conditions; 2) possible improvement in operating performance; and 3) net capacity growth.

Few copper mine cutbacks, so few restarts

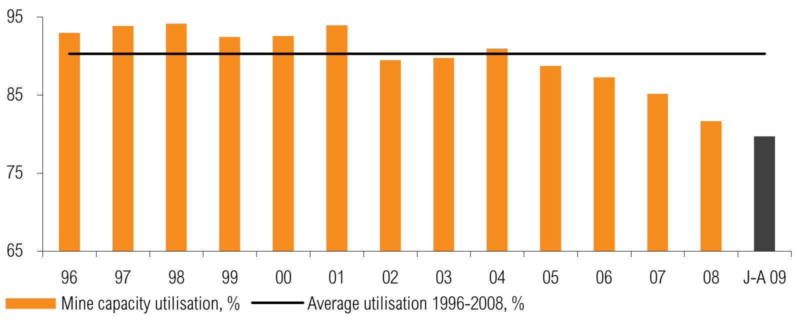
The roughly 0.5mtpa of copper mine capacity that we estimate closed in response to the collapse in demand and price of H2 08 represented just 3-4% of world mine production in 2008, far less than in other base metal industries. This is perhaps not surprising because copper was the last metal to succumb to the recession and even when it hit bottom in late 2008, the bulk of the mining industry was cash positive. Yet little of the closed copper capacity has so far restarted. The appreciation of key producer currencies has put upward pressure on costs, a portion of the capacity is dependent on other metals and some producers may still be wary of the economic outlook. Nevertheless, we expect most of the shut mine capacity to reopen in 2010-11. But the plain fact is that in contrast to other metals, **there is simply not that much to be restarted**.

We now estimate that world copper mine production will in the end have risen by a marginal 1% in 2009, helped by smaller strike-related losses in Latin America than had looked possible. But restarts alone will boost it by only about 3% over 2010-11, a period during which we expect demand to rebound by much more. The restarts on their own will do little more than take capacity utilisation back up to the very low level of 2008, as estimated by the ICSG.

Little reason to expect a material improvement in mine capacity utilisation

Even before the market-driven cutbacks had a material impact, between 2002 and 2008 world copper mine production rose by only about 15%, or less than 2.5% pa, despite the copper price more than quadrupling over the period. It is this that must really ring alarm bells for the supply outlook.

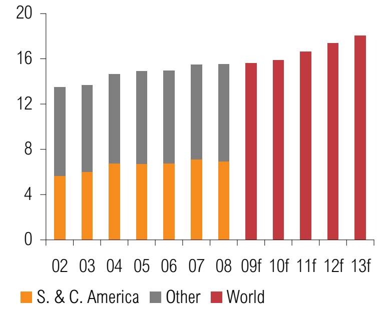
Copper mine capacity utilisation has been deteriorating for several years – so much so that it is likely the ICSG overstates effective capacity



Source: ICSG, RBS

ICSG data suggests the slow pace of growth was due not so much to sluggish capacity growth over the period, which it puts at a reasonably healthy 3.5% pa or so, as to a sharp decline in capacity utilisation. The ICSG's latest estimate is that world copper mine capacity utilisation in Jan-Aug 2009 was 2.5 percentage points down from the average in 2008. This looks plausible given the cutbacks, but harder to explain is the heavy fall since at least 2004 to less than 80%. It might appear to point to much potential for improvement, but so remorseless has the decline been that we consider it likely that the ICSG has increasingly overstated **effective** (as opposed to theoretical nameplate) global capacity.

World copper mine output (mt), 2002-13F – limited growth ahead

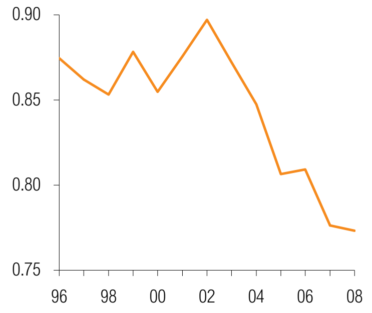


Source: CRU, RBS forecasts

One factor holding back copper production growth in recent years and perhaps also contributing to the overstatement of capacity has been the tendency of new mines and expansions to start up late and take longer than planned to reach full output. This has been due to a range of constraints including shortages of manpower, materials and equipment. More significant is that many existing mines have struggled to maintain production in the face of the same and other constraints such as shortages of replacement trucks and tyres, energy and water. Copper mines have been particularly prone to such constraints. The copper industry has also been hit harder than most by equipment breakdowns, accidents and strikes. Perhaps most significant of all has been a decline in ore grades. Giant Escondida is an albeit extreme example of such problems, with copper-in-concentrate production in Q1-Q3 2009 down fully 32% yoy.

Some of the constraints of recent years were in part creatures of the commodity and wider economic boom. So may have eased as recession reduced strains on infrastructure generally and on energy and water supplies in particular. But cuts in investment mean that such problems may well re-intensify in the medium term, while they are chronic in some key copper regions, notably Chile (water) and Zambia (electricity). Likewise, faults and accidents caused by plants being pushed hard in the boom times may now be replaced by problems resulting from cuts in maintenance expenditure and the paring of inventories of replacement equipment. Neither do we see any reason to believe natural hazards will diminish, indeed the developing El Niño could cause new problems.

Weighted average global copper head grade (%) down sharply



Source: CRU, RBS

Research by CRU shows that the weighted average global head grade at copper mines declined by 15% between 2002 and 2008. Geographically, this was driven mainly by developments in Chile, where grades have been sliding since the mid-1990s. Globally, it has been due to both lower grades at new capacity and declines at existing mines, where producers have struggled to compensate by boosting ore throughput. The coincidence between this trend and the decline in ICSG mine capacity utilisation is striking, even if it can provide only a very partial explanation of the latter. Although new projects in the African Copperbelt may slightly raise the world average grade in the short term, we expect the downward trend to resume in the medium and longer term.

Drawing all this together, we conclude that beyond an uptick in 2010-11 as the cutbacks are unwound, we see little reason to expect a material improvement in copper mine capacity utilisation as the ICSG measures it. Put another way, it seems probable that effective capacity at many facilities is **now permanently lower**, and it is possible that the aggregate capability of steady-state mines will continue to decline in the coming years. Either way, we believe new mines/expansions will have to do the heavy lifting in meeting copper demand in the coming years.

Top six copper mines – 2008 output and share of world total

	'000t	% of total
Escondida	1,250	8.0%
Codelco Norte	755	4.9%
Grasberg	521	3.4%
Collahuasi	464	3.0%
Norilsk	400	2.6%
El Teniente	381	2.5%
World total	15,533	

Source: Companies, Brook Hunt, CRU, RBS

No significant medium-term pick-up in copper mine capacity growth

We continue to highlight the paucity of big new copper mines due onstream in the next four years, and certainly nothing to compare with **Escondida**. Three projects – greenfield **Tenke Fungurume** in DR Congo and **Oyu Tolgoi** in Mongolia, and expansion at **Collahuasi** in Chile – each have the potential to produce over 400ktpa, but not until at least the middle of the next decade.

This need not matter if there are enough medium-sized and small developments, but another concern is that the credit crunch and recession led to mining companies slashing capital expenditure and slow-tracking or even cancelling projects, with copper far from immune. Nevertheless, many small and medium-sized new mines and expansions are due to come onstream by 2013. The table below lists a selected 16 of these based on CRU data. Moreover, recent months have seen a flurry of announcements about other projects now being fast-tracked for possible start-up before the end of 2013, although for some of them the timing looks ambitious. Xstrata, which, along with Rio Tinto, plans to raise capital expenditure sharply in 2010, is at the forefront, although its biggest copper project, 400ktpa Las Bambas, will not be commissioned before 2014/15.

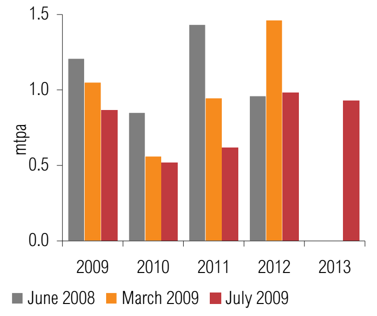
Planned production at selected mines contributing to copper mine capacity growth in 2009-13 (000t Cu) – growth all from small-to-medium sized additions

Mine	Company	Country	Type *	2008A	2009F	2010F	2011F	2012F	2013F	Addition 2008-13
Toromocho	Minera Chinalco Peru	Peru	C/G	-	-	-	-	182	208	**208**
Los Bronces	Anglo American	Chile	C/E	190	170	209	222	337	394	**204**
Esperanza	Antofagasta	Chile	C/G	-	-	24	191	191	191	**191**
Salobo	Vale	Brazil	C/G	-	-	-	79	127	159	**159**
Lumwana	Equinox Resouces	Zambia	C/G	8	110	200	163	156	159	**151**
Toquepala	Southern Copper	Peru	C/E	114	120	152	184	214	252	**138**
Gabriela Mistral	Codelco	Chile	X/G	71	145	164	178	201	201	**130**
Caserones	Regalito Copper	Chile	C/G	-	-	-	-	49	130	**130**
Tia Maria	Southern Copper	Peru	X/G	-	-	-	45	120	120	**120**
Grasberg	Freeport	Indonesia	C/E	521	691	745	585	585	639	**118**
Tenke Fungurume	Freeport/Tenke	DR Congo	X/G	0	64	100	115	115	115	**115**
Batu Hijau	Newmont	Indonesia	C/E	129	195	210	240	240	240	**111**
Alejandro Hales	Codelco	Chile	C/G	-	-	-	-	-	105	**105**
Radomiro Tomic	Codelco	Chile	C/G	-	-	62	100	100	100	**100**
Konkola/Konkola Deep	Konkola Copper	Zambia	C/E	40	50	87	82	106	133	**93**
Prominent Hill	OZ Minerals	Australia	C/G	-	88	90	90	90	90	**90**
Subtotal				**1,073**	**1,633**	**2,043**	**2,274**	**2,813**	**3,236**	**2,163**

* C = concentrate, X = leach/SX-EW, E = expansion, G = greenfield

Source: CRU, RBS

ICSG has steadily cut its copper mine capacity growth forecasts



Source: ICSG, RBS

As to overall net copper mine capacity growth, there has been a clear trend in recent years among the three organisations we consult to lower their forecasts due to project delays and downward revisions to estimated effective capacity at existing mines. ICSG's July 2009 forecast of net growth in world copper mine capacity between 2009 and 2013 was 15-16%, an average of just over 3.5% pa. This said, although CRU has continued to trim its more aggressive forecasts of potential mine production out to 2013, Brook Hunt has slightly raised its forecasts in recent months, partly to reflect the firming up of a few projects. It is quite possible there will be yet more project delays, but against this some projects do now appear to be moving ahead faster than appeared likely in early 2009. Our working assumption still is that 3.5-4.0% pa looks about right for copper mine capacity growth in 2010-13, if skewed towards the end of the period.

Production growth unlikely to exceed 4% pa, plenty of scope for shortfalls

In conclusion, the combination of limited restarts, modest capacity growth and no real signs of a structural improvement in operating performance will, we forecast, confine world copper mine production to increasing by 4% pa at most out to 2013. Our caution is due partly to the fact that a significant portion of the planned new capacity is in the African Copperbelt, which can only heighten project risk. On the face of it, production growth could be above trend in 2010, but we expect the main impact of restarts to be in 2011 and although strikes losses in 2009 have in the end been limited, there are plenty of labour contracts up for renewal right through the next 12 months. We consciously pencil in a very conservative forecast for world mine production growth in 2010 of less than 1.5% ahead of likely above-trend growth nearer 5% in both 2011 and 2012.

World committed copper mine production by region, 2006-13F – growth still dominated by Latin America but reliance on Africa rising

000t Cu	2006	2007	2008	2009F	2010F	2011F	2012F	2013F	Growth 2009-13F	Share of growth
South and central America	**6,740**	**7,150**	**6,940**	**6,745**	**7,075**	**7,595**	**8,125**	**8,375**	**1,630**	**47%**
– Chile	5,370	5,595	5,295	5,110	5,410	5,770	5,945	6,110	1,000	29%
– Peru	1,045	1,175	1,265	1,240	1,280	1,365	1,680	1,740	500	15%
Africa	**815**	**945**	**1,100**	**1,155**	**1,455**	**1,550**	**1,660**	**1,780**	**625**	**18%**
– Zambia & DR Congo	660	760	890	965	1,255	1,340	1,440	1,545	580	17%
Asia	**2,770**	**2,860**	**2,930**	**3,280**	**3,530**	**3,600**	**3,700**	**3,880**	**600**	**17%**
– China	820	915	1,045	1,060	1,170	1,270	1,325	1,375	315	9%
North America	**2,095**	**2,070**	**2,130**	**2,020**	**1,970**	**2,385**	**2,545**	**2,545**	**525**	**15%**
Other	**2,545**	**2,470**	**2,435**	**2,455**	**2,605**	**2,670**	**2,635**	**2,515**	**60**	**2%**
World – unadjusted	**14,965**	**15,495**	**15,535**	**15,655**	**16,635**	**17,800**	**18,668**	**19,095**	**3,440**	**100%**

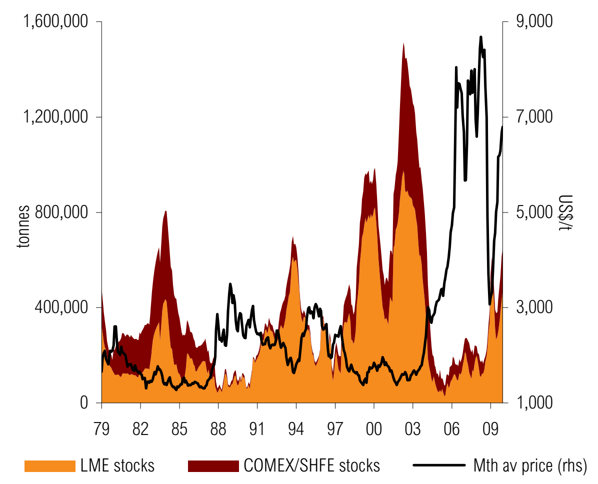
Source: CRU. RBS

We believe the concentrate market will remain tight throughout our forecast period, so do not expect world refined copper output to grow materially faster than mine production in any of the coming four years. At some point smelters may finally hold back to replenish severely depleted concentrate stocks, although the rescinding of cutbacks may delay this to beyond 2010.

Outlook − correction probable before all-time high

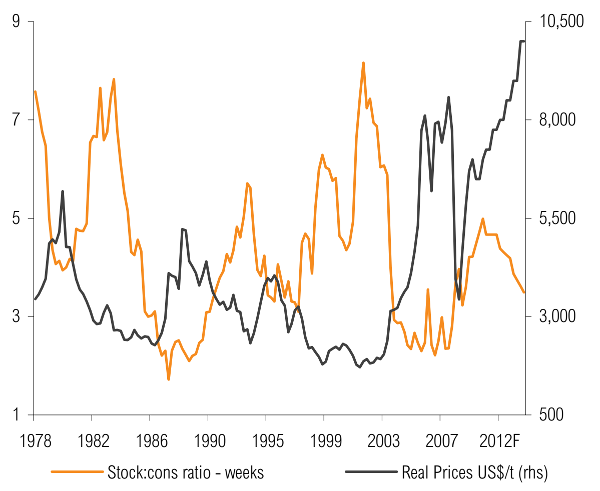
We stick to our very bullish medium-term view of copper. Indeed, we have slightly raised our price forecast for 2013 and now believe copper will reach a new record high well before the end of that year, then knock at the door of US$10,000/t. Copper remains our most favoured base metal, even though its price gains from current levels may not be the greatest. The latter simply reflects copper's already outstanding price recovery in 2009. We forecast that the copper market will be back in deficit by 2011 as even comparatively modest demand growth starts to run up against still only slowly increasing production capacity. Although the market may still not be as tight by 2013 as it was for much of 2005-08, we see every prospect of such by 2014-15. We expect investors to anticipate this outlook.

Copper exchange stocks and price – stocks remain historically modest



Source: LME, SHFE, COMEX, RBS

Copper stock:consumption ratio and real price – inventory cover expected to drop back from 2011

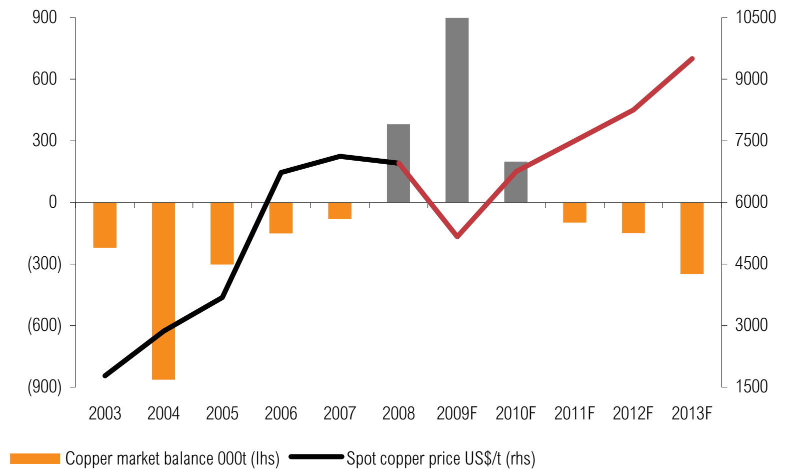


Source: LME, ICSG, CRU, RBS forecasts

The extent of copper's price recovery suggests the market shares our view. However, it may have got ahead of itself, for copper still has plenty of work to do before conditions begin to truly tighten. The copper market has been in hefty underlying surplus in 2009 that we now estimate at fully 0.9mt, following about 400kt in 2008. That reported commercial inventories have so far risen by barely 300kt since end-2007 is, we believe, explained by stockpiling in China of perhaps 1.1mt since Q3 08. Only 20-25% of this is in the strong hands of the SRB and whilst some of the rest may have been genuine consumer restocking, most has, we suspect, been more speculative. It seems unlikely that stockpiling will continue at present prices and we think it probable that much material will leak back into the market in the coming years. On top of that, we expect copper to remain in surplus in 2010, even on our deliberately conservative production forecasts, ahead of a cumulative deficit in 2011-13 of perhaps 600kt.

We therefore forecast that copper's reported ratio of stocks to consumption will continue to climb in 2010, although we do not expect it to escalate to anything like the excessive levels already seen in some other base metal markets. This, coupled with the more general headwinds that metals may face, suggests that the copper price will come under some downward pressure in 2010. Given, though, the higher-than-expected starting point, we have left our forecast of the average 2010 price unchanged at US$6,750/t, representing a yoy rise of about 30%. We expect the copper price to resume its upward march in late 2010 and still forecast that whilst a new absolute record high may have to wait until 2013, a new high in annual average terms could come as soon as 2011. We have marginally raised our forecast for 2011 to US$7,500/tonne; left 2012 unchanged at US$8,250/tonne and boosted 2013 by 5-6% to all of US$9,500/tonne.

World copper supply/demand surplus and deficits, 2003-13F; back to underlying deficit from 2011, price forecast to hit new record highs



Source: CRU, LME and RBS forecasts

Zinc

Another year of hefty supply surplus lies ahead

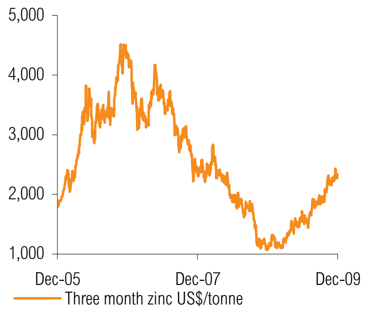
The price recovery has now extended to 130%, but having recouped only 40% of its bear market losses, zinc still lags copper and lead, as we believe befits its fundamental position. The market has moved deeper into surplus in 2009, even if this has been masked by Chinese stockpiling. We expect it to remain in hefty surplus in 2010 as producer restarts offset strong demand growth, and reported stocks could spiral to well above the levels of 2002-03. However, the pipeline of new capacity is thin and we forecast that zinc will begin to shift into deficit in 2012, quickly eroding excess inventory. Zinc may be more exposed than some to a correction in 2010, but it should come into its own by 2012 and we now forecast an average price in 2013 of US$2,850/t. The biggest risk is of price escalation being brought forward as investors anticipate a tighter market.

Demand – robust rebound from deep trough

With world zinc demand down as much as 17% yoy in the first half, we now estimate that the total will have slumped by 8-9% in 2009 as a whole. That zinc has fared significantly worse than sister metal copper is due to contrasting developments in China. Whereas Chinese refined copper demand growth has re-accelerated strongly in 2009, mainly due to a sharp decline in the availability of direct use scrap earlier in the year, growth in the country's zinc use has slowed further. Although ILZSG figures show a surge in Chinese zinc demand in Q1-Q2 2009 of 15% yoy, we believe this includes much stockpiling (of which more below) and think growth of roughly 6% for 2009 as a whole is more plausible. Even that stands in stark contrast to a collapse elsewhere of over 15%.

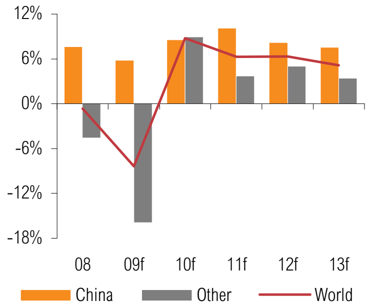
Grim though these statistics are, there have been some signs of improvement in recent months, with world demand up perhaps 10% yoy in Q4 09. This base effect should be favourable through most of 2010 and substantial destocking has come to an end. Meanwhile, buoyant China's market share has reached 40%.

Zinc price has recovered by 130% but only 40% of previous losses



Source: LME

World refined zinc demand may bounce by 9% in 2010



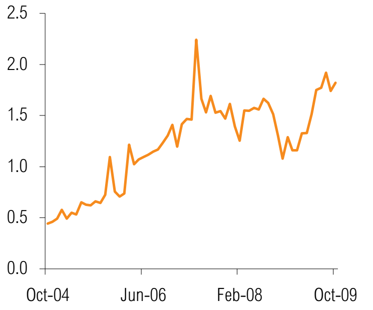
Source: CRU, ILZSG, RBS forecasts

RBS world zinc supply/demand balance, 2006-13F – continued surplus in 2010, large deficit in 2012-13F

(m tonnes)	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World zinc mine production	**10.29**	**11.17**	**11.58**	**11.00**	**11.40**	**11.75**	**12.05**	**12.45**
Change %	**4.6%**	**8.6%**	**3.7%**	**-4.2%**	**2.7%**	**3.1%**	**2.6%**	**3.3%**
of which China	2.70	3.05	2.98	2.75	2.85	2.90	3.00	3.15
Change %	16.1%	13.0%	-2.5%	-7.6%	3.6%	1.8%	3.4%	5.0%
World refined zinc production	**10.65**	**11.41**	**11.67**	**11.15**	**11.65**	**11.95**	**12.25**	**12.75**
Change %	**4.6%**	**7.3%**	**2.3%**	**-4.4%**	**4.5%**	**2.6%**	**2.5%**	**4.1%**
of which China	3.22	3.84	3.97	4.25	4.50	4.55	4.75	5.05
Change %	15.4%	19.1%	3.5%	7.1%	5.9%	1.1%	4.4%	6.3%
World refined zinc consumption	**11.04**	**11.26**	**11.19**	**10.25**	**11.15**	**11.85**	**12.60**	**13.25**
Change %	**5.1%**	**2.0%**	**-0.7%**	**-8.4%**	**8.8%**	**6.3%**	**6.3%**	**5.2%**
of which China	3.30	3.60	3.88	4.10	4.45	4.90	5.30	5.70
Change %	13.8%	9.1%	7.6%	5.8%	8.5%	10.1%	8.2%	7.5%
Implied market balance	**-0.39**	**0.14**	**0.48**	**0.90**	**0.50**	**0.10**	**-0.35**	**-0.50**
Actual reported inventory	0.55	0.63	0.83	1.10	1.65	1.85	1.60	1.20
Reported change in inventory	-0.28	0.09	0.19	0.28	0.55	0.20	-0.25	-0.40
Stock: consumption ratio (weeks)	**2.6**	**2.9**	**3.8**	**5.6**	**7.7**	**8.1**	**6.6**	**4.7**
LME spot price US$/tonne	**3,272**	**3,249**	**1,870**	**1,650**	**1,975**	**2,150**	**2,450**	**2,850**
LME spot zinc price US¢/lb	**148**	**147**	**85**	**75**	**90**	**98**	**111**	**129**
Change %	**137%**	**-1%**	**-42%**	**-12%**	**20%**	**9%**	**14%**	**16%**

Source: CRU, ILZSG, RBS estimates and forecasts

Chinese production of galvanised steel (mt) rebounded rapidly



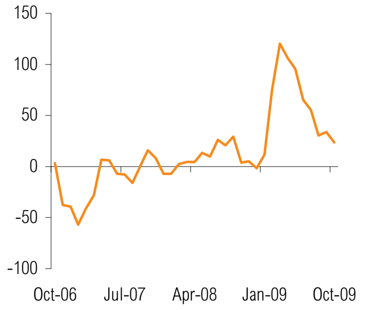
Source: Bloomberg, RBS

Zinc's first and end-use profile means it was just as exposed to the recession as other metals, but equally that it stands to benefit fairly fully from the economic revival. Some sectors may lag behind (non-residential construction) or have had a temporary boost (the car industry), but so severe was the downturn across all sectors in H1 09 that base effects alone should ensure strong demand growth in 2010. Galvanised steel production (fully 50% of total zinc use) was hit particularly hard, but showed some signs of revival as early as Q3 09, notably in China, while some areas of construction and infrastructure (together 60% of final use) should do well, again especially in China. All in all and including consumer restocking, we now forecast that world zinc demand will rebound by 9% in 2010.

Yet even that would leave the global total short of its 2007 peak, and after the last comparable downturn in 1974-75, zinc demand surged by 14% in 1976. We therefore expect further strong growth in 2011, of 6-7%. Our forecast CAGR between 2009 and 2013 of about 6.5% pa may look a stretch given that growth was less than 4% pa trough to peak from 2001 to 2007, when the world economy was booming. But the trough of 2009 has been so much deeper. Besides, our forecasts have growth in China at 'only' 8.5% pa compared with 15% in 2002-07, and non-Chinese demand not returning to its 2004 peak even by 2013.

China may have stockpiled at least 900kt of zinc, mostly from imports

Chinese net imports of refined zinc (000t) down sharply from peak

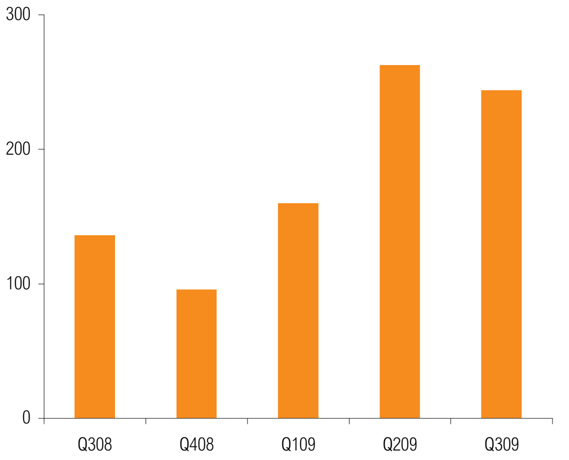


Source: Chinese General Administration of Customs, RBS

Whatever the true level of world zinc demand in 2009, apparent demand was higher, due to stockpiling activity in China. A simple calculation from domestic production, net imports and changes in SHFE stocks points to growth in Chinese apparent demand in Q1-Q3 2009 of fully 20% yoy. This does not look plausible as a measure of real demand. Based on our estimate that real Chinese demand rose by a bare 1%, we conclude that there was **a build-up of refined zinc stocks in China of about 900kt over the five quarters to Q3 09**. The purchase of 159kt by China's SRB accounted for less than 20% of this. The rest was a combination of unconventional stockpiling involving provincial authorities and speculative hoarding by consumers, traders and others.

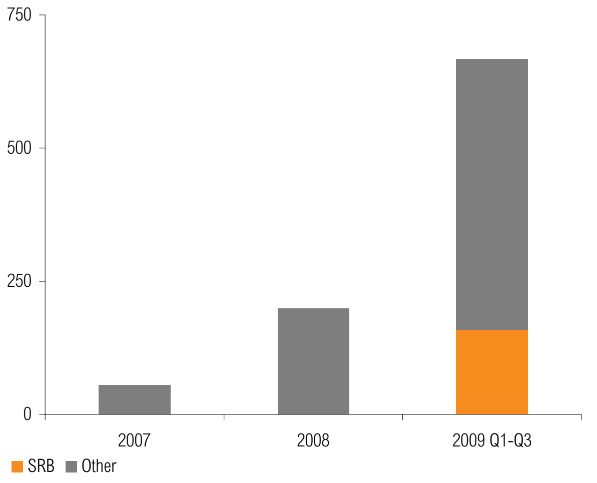
China is not structurally short zinc, so the SRB's stockpile cannot be considered strategic in the same way as that of copper and is unlikely to be held for the long term. We expect sizeable tonnages of SRB and other stockpiles to trickle back into the market in the coming years. Near term, Chinese imports are likely to decline further from their March 2009 peak, especially as the LME-SHFE price differential has for some months been such as to make them unprofitable.

Implied build-up of off-market stocks of refined zinc in China – perhaps 900kt plus over Q308 to Q309



Source: CRU, Chinese General Administration of Customs, RBS

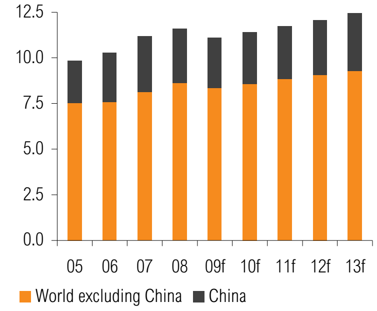
Implied build-up of off-market stocks of refined zinc in China – far more than just SRB buying



Source: CRU, Chinese General Administration of Customs, RBS

Restarts mounting, but supply constraints loom

World zinc mine production, mt − slow recovery ahead

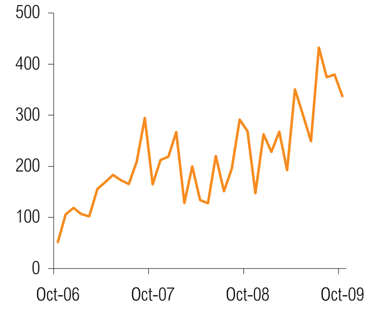


Source: CRU, ILZSG, RBS forecasts

World zinc production has not fallen as heavily in 2009 as looked likely nine months ago. This is chiefly due to restarts in the large, fragmented (and hard to monitor) Chinese mining industry as early as Q2, when the zinc price was still low. Outside China, mine cutbacks implemented in H2 09 and H1 09 totalled an estimated 1.1mt of annual capacity (nearly 10% of global output in 2008) and even now announced restarts amount to just 200ktpa, dominated by mines in the US. Despite the uncharacteristic discipline in much of the zinc industry, we now estimate that world mine production will have fallen by only about 4% in 2009. If anything, the decline may prove to be even less.

The same is true of our similar forecast for world refined zinc production (down 4.5%). Chinese smelters were among the first to cut back in Q4 08 but, though hard to track, it appears many were also quick to restart. The country's imports of concentrates have soared to record levels in 2009 (up 58% yoy in Jan-Oct). The lead pollution incidents had only a small impact on the Chinese zinc smelting industry and have been swamped by a steady flow of new plant coming onstream. Elsewhere, cutbacks totalled an estimated 1.2mtpa of capacity (10% of 2008 global output) at their peak, but restarts have been greater to date than in the mining industry, with roughly half of the capacity firing up in H2 09.

Chinese zinc concentrate imports (000t) have soared in 2009



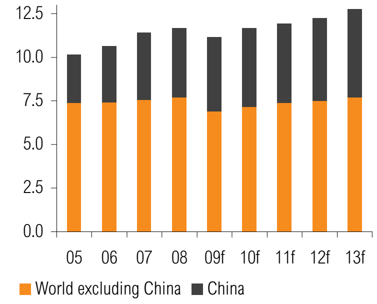
Source: Chinese Gen Admin of Customs, RBS

The flip side of zinc output declining only modestly in 2009 is that there will be more limited scope for growth in 2010-11 from the further unwinding of cutbacks. Moreover, although it is unlikely that there will be any fresh voluntary cuts in the mining industry and almost all mines should now be comfortably cash positive, we still expect some caution to be exercised. The bulk of the zinc mine cutbacks were outright closures and restarting is a complex business not undertaken lightly, while a few of them still look permanent or semi-permanent.

As to capacity growth in 2010-11, there is a reasonably healthy list of new mines and expansions. But with the exception of 200ktpa **Peñasquito** in Mexico, most are small and the combined additions will be largely offset by contraction at **Antamina** (Peru) and the exhaustion of 250ktpa **Brunswick** (Canada). We forecast that world mine production will increase by only about 6% between 2009 and 2011, albeit the risks are increasingly on the upside.

Beyond 2011, there should still be some additional output from straggler restarts, but much of the committed new capacity will be through the system by then, so continued mine production growth will depend greatly on as yet uncommitted projects. Although the list of these is always lengthy and the zinc mining industry has relatively short lead times and low barriers to entry, there are few really big projects for the period to 2013. We expect world mine output to rise by only about 6% between 2011 and 2013, even though we forecast that prices will be highly attractive by then. In all, we forecast that production will increase by little more than 12% between 2009 and 2013. What is more, 2014/15 will see the closures of, among other mines, giant 510ktpa **Century**, 165ktpa **Lisheen** and 115ktpa **Perseverance**.

World refined zinc output, mt − a bigger bounce, then constrained



Source: CRU, ILZSG, RBS forecasts

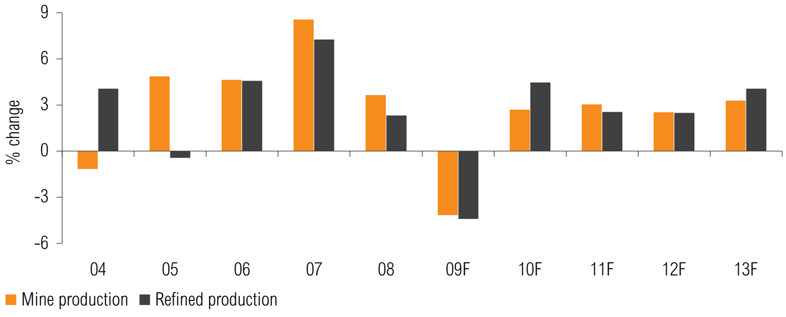
Refined production may rise slightly faster from the low base of 2009, first because smelters may choose to run down the concentrate stocks that built up in 2008 and H1 09, and second because processing of scrap should pick up strongly. We see no signs of a shortage of smelter capacity. That the bulk of scheduled capacity growth in the coming years is in China may be viewed as a source of concern, but as long as Chinese output reverts to being below local demand, we doubt the authorities will curb net expansion materially. We forecast that world refined zinc production will rise by 14-15% between 2009 and 2013. Growth could be above trend in 2010 as cutbacks continue to be unwound, but in the longer term it will be constrained by tightening concentrate supply.

Selected price-related production cutbacks in the zinc industry since mid-2008; reactivations highlighted in red

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Mines			
Lennard Shelf, Teck/Xstrata, Australia	Implemented August 2008	Early closure of ~75kt/y mine	
Balmat, HudBay, US	Implemented August 2008	Closure of 55kt/y mine	
Hellyer, Intec, Australia	Implemented September 2008	Closure of ~25kt/y mine	
Broken Hill, Perilya, Australia	Implemented September 2008	Cut by 36kt/y from 07/08 level of 91kt	Closure of North mine but head grade up
Golden Grove/Scuddles, OZ Minerals, Australia	Announced September 2008/January 2009	To cut Golden Grove, then close Scuddles	Total cut ~75kt/y
Gordonsville et al, SRA, US	Announced October 2008	Closure, plan was to reach 60kt/y	Nyrstar gradually restarting from Q3 09
Endeavor, CBH Resources, Australia	Announced October, November 2008	To cut to ~30kt/y from plan of >60kt/y	Plans return to full output by mid-2010
Mt. Garnet, Kagara Zinc, Australia	Announced October 2008	To cut 08/09 target output by 8kt to 32kt	
Caribou/Restigouche, Blue Note, Canada	Implemented November 2008	Closure of ~50kt/y operation	
Myra Falls, Breakwater Resources, Canada	Announced November 2008	Was to close ~38kt/y mine but revoked	
Langlois, Breakwater Resources, Canada	Implemented November 2008	Closure of ~38kt/y mine	
Neves-Corvo, Lundin Mining, Portugal	Implemented November 2008	Closure of zinc section, ~25kt/y	
Aljustrel, Lundin Mining, Portugal	Implemented, November 2008	Closure, was to build up to 80kt/y	
Minera Rosaura, Perubar (Glencore), Peru	Implemented November 2008	Closure of small mine	
Century, OZ Minerals, Australia	Announced November 2008	To cut 2009 production by 4%, 20kt	
McArthur River, Xstrata, Australia	Announced December 2008	To cut 2009 production by 20%, ~32kt	
East Tennessee, Glencore, US	Announced December 2008	To close 57kt/y mines in February 2009	Nyrstar to restart by end 2010
Pend Oreille, TeckCominco, US	Announced December 2008	To close 31kt/y mine in February 2009	
ShalkiyaZinc, Kazakhstan	Announced December 2008	To close 25kt/y mine	
SE Missouri, Doe Run, US	Announced January 2009	To cut by ~17%, ~7kt/y	Started to raise output in October 2009
Cerro de Pasco, Volcan, Peru	Announced January/April 2009	Closed open-pit section, cut ~40kt/y	Restarting from September 2009
Chisel North/Snow Lake, Hudbay Min., Canada	Announced January 2009	To close ~25kt/y operations	Restart in November 2009
Galmoy, Lundin, Ireland	Announced January 2009	To close ~80kt/y mine early, May 2009	
Akbastau/Belousovskoe, Kazakhmys, Kazakhstan	Announced January 2009	Closing 2 mines, production lost ~20kt/y	
Iscaycruz, Glencore, Peru	Implemented March 2009	Closure of 175kt/y mine	
Smelters			
Datteln, Ruhrzink (GEA), Germany	Announced October 2008	Closure of 135kt/y plant in December 2008	
Chelyabinsk, Russia	Announced October/December 2008	To cut production in 2009 by 60-70kt	To return to full production in 2010
Huludao, China	Implemented October 2008	Cut production by 27%, 105kt/y	65kt of 200kt/y and 40kt of 130kt/y
Yunnan Luoping, China	Implemented October 2008	Cut by 32% at 80kt/y plant	Full restart in July 2009
Zhuzhou, China	Implemented November 2008	Cut by 33% of 400kt/y capacity	
Hanzhong Bayi, China	Implemented November 2008	Cut by 10-20% at 120kt/y plant	
Western Mining, China	Implemented November 2008	2008 target output cut by 16kt from 70kt	
Budel, Nyrstar, Netherlands	Implemented November 2008	Cut by 28% at 260kt/y plant	Back to full production July 09
Balen, Nyrstar, Belgium	Implemented November/December 2008	Cut by 28%, then closed 275kt/y plant	To restart in Q4 09 at 70% capacity
Trail, TeckCominco, Canada	Implemented November 2008	Cut by 50-60kt/yof 310kt/y capacity	Restart full output Sept 2009
Juiz de Fora/Tres Maria, Votorantim, Brazil	Announced November 2008	Cut 12kt/y of combined capacity of 290kt/y	
Onsan, Korea Zinc, Korea	Implemented December 2008	To cut 2009 production by 10%, 45kt	
Sukpo, Young Poong, Korea	Implemented December 2008	Cut by 10%, 29kt of 285kt/y	
Kokkola/Odda, Boliden, Finland/Norway	Implemented December 2008	Cut by combined 60kt/y	Back to full production September 2009
Annaka, Toho Zinc, Japan	Announced December 2008/April 2009	Cut by ~20% at 137kt/y plant for Q1-Q3 09	
Clarksville, Nyrstar, US	Announced December 2008	To cut by 40%, 50kt/y of 125kt/y	Back to full production July 09
Kidd Creek, Xstrata, Canada	Implemented (but unannounced) Q1 09	Cut by ~20% at 147kt/y	To close permanently May 2010
Monaca, Horsehead Corp., US	Implemented January 2009	Cut by 17% at 155kt/y plant	Restart 1 of 2 furnaces August 2009
Harima, Sumitomo, Japan	Announced January 2009	Cut by 30%, annualised 27kt	Cut through H1 09
Plovdiv, KCM, Bulgaria	Announced January 2009	To cut by ~17%, 13kt/y	
Copsa Mica, Mytilineos, Romania	Announced January 2009	To close 65kt/y smelter	
Valleyfield, Noranda IF, Canada	Announced February 2009	Cut by 20% at 280kt/y plant	Back to full production Q4 09
Balkhash, Kazakhmys, Kazakhstan	Implemented March 2009	Closed 80kt/y plant	Production usually ~50kt/y
La Oroya, Doe Run, Peru	Implemented March/June 2009	Forced to cut then close 45kt/y plant	Due to financial/environmental problems
Iijima, Dowa, Japan	Announced April 2009	Cut by 28% in H1 09/10 at 203kt/y plant	Back towards full production in Q4 09
Hachinohe/Hikoshima/Kamioka, Mitsui, Japan	Announced April 2009	Cut 5% in H1 09/10, combined cap 267kt/y	Back towards full production in Q4 09

Source: Company reports, Reuters, Bloomberg, RBS

World mine and refined zinc production, 2004-13F, yoy % change – refined output to recover faster but then constrained by tighter concentrate supply

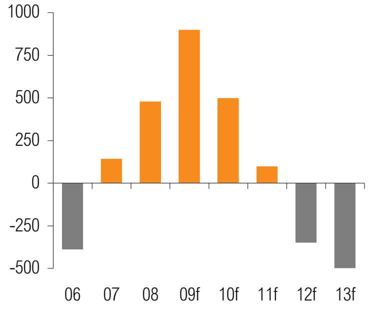


Source: CRU, ILZSG, RBS forecasts

We expect China to account for about 50% of world refined zinc production growth in 2010-13, which would take its market share up to fully 40%. But we do not expect the country to return to having a structural surplus of metal; on the contrary, there may be a growing deficit. However, China's actual trade in refined zinc will follow a slightly different path if some or all of the very large stocks that have built up in the country in the past 18 months trickle back into the market. The country may even return to being an occasional net exporter if the LME-SHFE price differential adjusts to make shipments profitable.

Outlook – struggle short term, then rapid tightening

Zinc supply/demand balance (000t) – back in deficit by 2012F



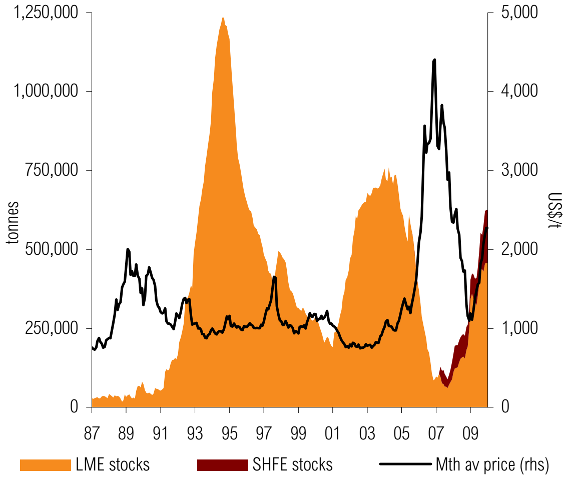
Source: CRU, RBS forecasts

Zinc's prospects over the coming year or so depend partly on what happens to the unconventional inventories that we are convinced have accumulated since 2006 and especially since mid-2008. The slump in demand and the smaller than expected decline in zinc production means that we now estimate an underlying global surplus in 2009 of fully 0.9mt, taking the cumulative surplus in 2007-09 to as much as 1.5mt. Yet reported producer, consumer, merchant and exchange stocks have to date risen by barely 0.55mt since end-2006. We believe the difference is more than fully accounted for by a big build-up of off-market inventories in China over the past several quarters. We suspect much of this material will trickle out at least into the Chinese market in the coming years.

Moreover, at the same time, we now forecast that the zinc market will remain in a hefty underlying surplus in 2010 of perhaps 0.5mt as production restarts offset strong demand growth. If our supply/demand projections prove close to the mark and if just a small portion the Chinese stocks resurface, then reported inventories could escalate to eight weeks of world demand in 2011, well in excess of the levels of 2002-03. However, we expect 2011 to be a transition year. After the restarts are through the system, the lean pipeline of new mine capacity suggests that producers will struggle to keep up with still strongly growing demand. We expect the zinc market to shift into a large deficit in 2012-13 that should quickly erode excess stocks. The mine closures scheduled for 2014-15 may lead to a prolonged period of tightening market conditions.

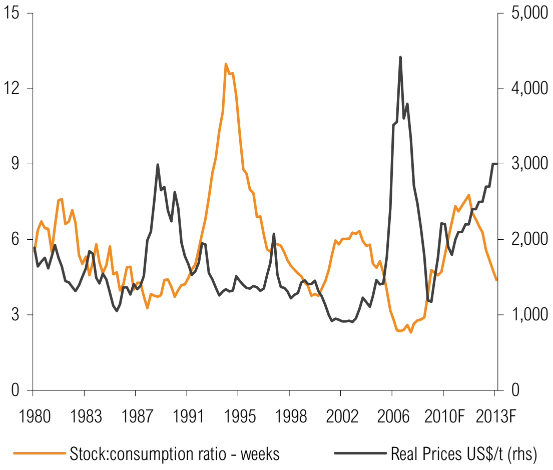
On traditional fundamental grounds, **a case could be made for the zinc price first to halve from present levels, then triple or more over the course of the next four to five years**. But we think such a price evolution is unlikely. First, a halving in price would bring producer restarts to a grinding halt and lead to renewed cutbacks, thereby eliminating the expected surplus of 2010. Second, we expect the market and investors to continue broadly to see through poor current and short-term future fundamentals and to focus more on longer-term, much rosier prospects. Long gone are the days when the zinc and other base metal prices were tied primarily to the fundamentals of the day.

Exchange zinc stocks and spot zinc price – rising stocks, rising prices; inventory becoming onerous



Source: LME, SHFE, RBS

Zinc stock:consumption ratio and real price – ratio to escalate further but to decline sharply in 2012-13



Source: LME, ILZSG, CRU, RBS forecasts

Nevertheless, we do expect zinc to come under some downward price pressure in 2010, from both its own increasingly oppressive inventory position and the more general headwinds that may affect all base metals. Zinc does not stand out from the crowd in this respect because it is in the middle of the pack both fundamentally and in terms of its price recovery to date from the trough of late 2008. However, we still believe that zinc will come into its own in 2012-13. It may not be the first base metal to move into deficit, nor end the period with the tightest stocks position. **But zinc's shift from surplus to deficit, when it comes, may be rapid and we see every prospect of further market tightening beyond 2013**.

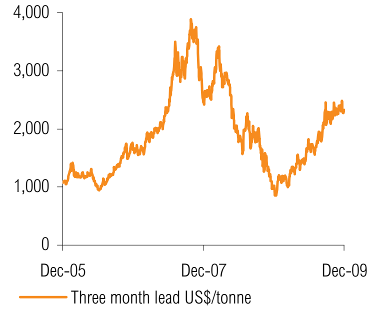
We have cut marginally our forecast of the average LME cash zinc price in 2010 to US$1,975/t and have adjusted our quarterly profile to reflect our belief now that a correction for base metals may come sooner, in Q2 rather than Q3. But we have raised slightly our forecast for 2012 and have made a big upward revision for 2013. We now forecast that zinc will average fully US$2,850/t in 2013, with the price challenging US$3,000/t well before the end of that year. The biggest risk to our forecast profile remains that price escalation could be brought forward as investors anticipate tight market conditions in 2013 and beyond.

Lead

Off to the races again in 2011-13

Even after its outstanding price recovery of the past 12 months, we believe the medium-term outlook for lead is bullish and it remains one of our top metal picks. Lead demand has held up relatively well through the recession and although its cyclical recovery may be comparatively muted, underlying trends are firm. Secondary production cannot on its own satisfy all the additional demand through the cycle and the primary sector is hampered by lead's by-product status in most of the mining industry. Reported stocks may continue to rise over the next 12 months, but we expect them to remain historically low and forecast that the market will return to supply deficit in 2011-13, leaving it at least as tight as in 2006-07. We expect a period of price correction in 2010, but although the absolute peak of the last bull market may still be out of reach, we forecast that the annual average price will race to a new record high of US$3,100/t in 2013

Lead price nearly trebled at best, recouping half previous losses



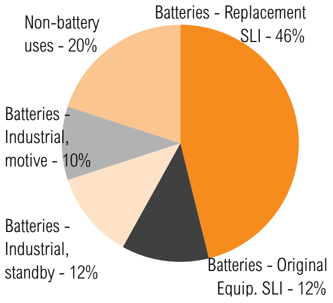
Source: LME

Demand – cyclical laggard, but structurally firm

World lead demand has not held up quite as well in 2009 as we had expected, but with a decline that we now forecast at 3.0-3.5%, it will still have been more resilient than other base metals. The ILZSG estimates that demand actually rose marginally in Q1-Q3, but this includes growth in China of fully 26%, which to us looks unlikely, of which more below. We expect Chinese growth to slow to 7-8% this year, with demand elsewhere tumbling by as much as 9-10%.

Lead's resilient but slightly disappointing record is illustrated by North American automotive battery shipments. Original equipment (OE) units collapsed by 32% yoy in Jan-Oct, but the far bigger and largely (yet clearly not wholly) recession-proof replacement sector was flat, leaving the combined total down 5%. The OE sector has fared less badly elsewhere, but global light vehicle sales may fall by up to 10% in 2009. With industrial batteries and non-battery use poor, too, replacement batteries may account for over 45% of total lead demand in 2009.

Estimated world lead demand by end use – less cyclical



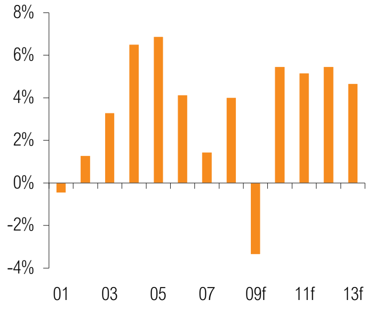
Source: Brook Hunt, RBS

RBS world lead supply-demand balance, 2006-13F; return to deficit in 2011, severe tightness by 2013

(m tonnes)	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World lead mine production	**3.60**	**3.68**	**3.80**	**3.75**	**3.85**	**4.00**	**4.15**	**4.30**
Change %	1.2%	2.1%	3.4%	-1.4%	2.7%	3.9%	3.8%	3.6%
World primary refined production	**3.62**	**3.59**	**3.82**	**3.65**	**3.80**	**3.95**	**4.10**	**4.25**
World secondary refined production	**4.32**	**4.55**	**4.83**	**4.85**	**5.00**	**5.15**	**5.35**	**5.65**
World refined lead production (incl US DNSC sales)	**7.95**	**8.14**	**8.65**	**8.50**	**8.80**	**9.10**	**9.45**	**9.90**
Change %	**3.5%**	**2.4%**	**6.3%**	**-1.7%**	**3.5%**	**3.4%**	**3.8%**	**4.8%**
of which China	2.72	2.79	3.15	3.35	3.55	3.70	3.90	4.15
Change %	13.6%	2.7%	13.0%	6.3%	6.0%	4.2%	5.4%	6.4%
World refined lead consumption	**8.09**	**8.21**	**8.54**	**8.25**	**8.70**	**9.15**	**9.65**	**10.10**
Change %	**4.1%**	**1.4%**	**4.0%**	**-3.4%**	**5.5%**	**5.2%**	**5.5%**	**4.7%**
of which China	2.21	2.57	3.09	3.32	3.62	3.92	4.22	4.48
Change %	15.1%	16.3%	19.9%	7.4%	9.2%	8.3%	7.7%	6.2%
Implied market balance	**-0.14**	**-0.07**	**0.11**	**0.25**	**0.10**	**-0.05**	**-0.20**	**-0.20**
Actual reported inventory	0.27	0.27	0.31	0.40	0.55	0.55	0.45	0.30
Reported change in inventory	-0.02	-0.00	0.04	0.09	0.15	0.00	-0.10	-0.15
Stock: consumption ratio (weeks)	**1.7**	**1.7**	**1.9**	**2.5**	**3.3**	**3.1**	**2.4**	**1.5**
LME spot price US$/tonne	**1,287**	**2,594**	**2,084**	**1,720**	**2,250**	**2,500**	**2,800**	**3,100**
LME spot price USc/lb	**58**	**118**	**95**	**78**	**102**	**113**	**127**	**141**
Change %	**32%**	**102%**	**-20%**	**-17%**	**31%**	**11%**	**12%**	**11%**

Source: CRU, ILZSG, RBS estimates and forecasts

World refined lead demand, % change 2001-13F – solid trends



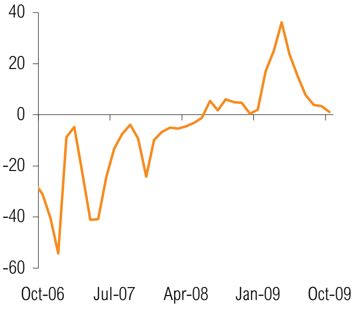
Source: CRU, RBS forecasts

The corollary of lead's resilience in 2009 is that the cyclical rebound in demand in 2010 is likely to be less pronounced than that for other metals. Replacement automotive battery demand may grow only slightly faster than in 2009. Moreover, RBS expects world vehicle sales to recover by only 3-5% next year, the real bounce coming in 2011, while industrial batteries tend to track later-cycle capital spending. Yet lead should, like other metals, benefit from healthy restocking after the ravages of 2009, and buoyant China's market share is now fully 40%. We expect world lead demand to rise by over 5% in 2010.

Lead's CAGR between 2001 and 2007 was nearly 4% pa, at least in line with copper and zinc and a substantial improvement on previous cycles. Much of the zest came from the explosive growth of the electric bicycle market in China and this is unlikely to be matched in the coming years. But from a deeper trough and with China's market share far higher than in 2001, we believe that global lead demand growth from 2009 to 2013 could average over 5% pa.

Chinese stockpiling has tailed off sharply since Q2 09

Chinese net imports of refined lead (000t) have plunged since Q209



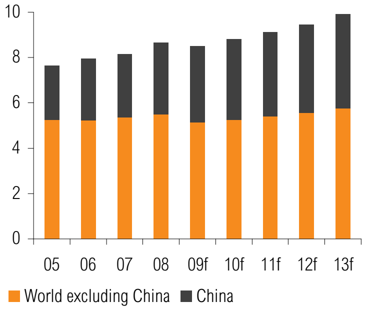
Source: Chinese General Administration of Customs, RBS

We estimate that real world lead demand fell by about 5% yoy in Q1-Q3 2009, but apparent demand was much firmer due to stockpiling activity in China. A simple calculation from domestic production and net trade points to growth in Chinese apparent demand in Q1-Q3 2009 of 13-14% yoy based on our conservative output estimates (and much more on NBS and ILZSG figures). This looks high as a measure of real demand. Based on our estimate that real Chinese demand rose by only about 7%, we conclude that there was a build-up of refined lead stocks in China of about 250kt over the five quarters to Q3 09.

Although our estimate of 250kt is modest compared with other metals, the true figure may be rather higher and none of the lead buying was by the State Reserves Bureau (SRB). Provincial authorities may have been involved and there was probably also rather more speculative hoarding by consumers, traders and others. But activity has tailed off sharply in recent months, with net Chinese imports negligible by October. We expect much of the stockpile to trickle into the market in the coming years, but crucially, as we explain later in this review, we do not expect China to return to being a major net exporter of lead to the west.

Supply − constraints will re-emerge before long

World refined lead production (mt) – China's share already at 40%



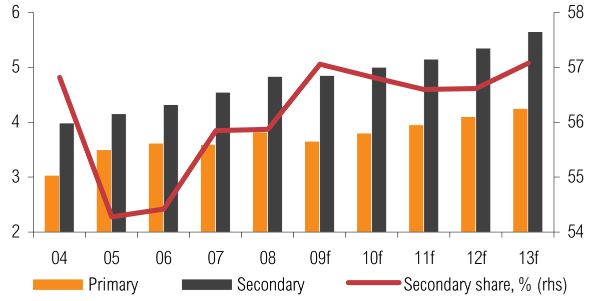
Source: CRU, ILZSG, RBS forecasts

Whereas we have raised our estimate of the percentage decline in demand, we have sharply cut our estimate of the fall in world refined lead production in 2009, to less than 2%. It was always likely that global production of lead would decline by less than that of most metals, due to the relative inelasticity of secondary supply and the comparatively modest cutbacks in the primary sector. But our upward revision of output is primarily related to specific developments in China.

Although we suggested in the Commodity Companion of October 2009 that the overall impact of the serious pollution incidents in China of Q3 09 would not be huge, the local lead smelting industry has bounced back even more quickly than we expected. Roughly 200ktpa of capacity remains closed, but recently issued new emission standards could allow even this to reopen and should not be too challenging for most of the rest of the industry. Meanwhile, a steady stream of new, cleaner capacity has started up, with plenty more to come in 2010 and beyond. Nevertheless, the events of 2009 have demonstrated the risks in overreliance on the Chinese lead smelting industry. Already in 2008, China accounted for fully 60% of global primary production and 36% of total output, and the latter has risen to 40% in 2009.

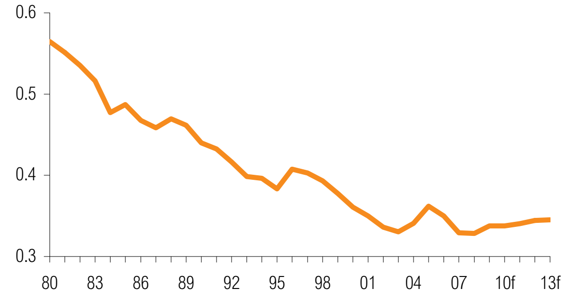
We now believe world secondary refined lead production will have increased marginally in 2009, despite slower growth in China, the closure of a few plants elsewhere and the reduced availability of scrap batteries earlier in the year. With primary output down perhaps 4.5%, **the secondary sector's share of the total has climbed to a record 57%**. This high share is significant because the secondary sector has only limited sensitivity to the lead price. As the bulk of scrap comes from spent vehicle batteries, the collection of which is mandatory in many countries, the pool will continue to expand, but only broadly in line with past growth in the global vehicle population. The annual growth rate here is slower than the rate of growth in lead demand we expect in 2010-13, and the gap can only partly be bridged by further improvement in collection and recycling rates. We forecast that world secondary production will increase by at most 4% pa.

World refined lead production, 2004-13F (mt) – growth constrained by raw material inflexibilities



Source: CRU, ILZSG, RBS forecasts

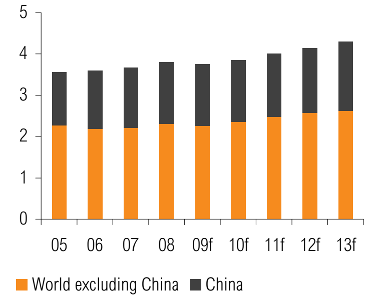
World mine production of lead per tonne of zinc – has at least stabilised after remorseless decline



Source: CRU, ILZSG, RBS forecasts

The above means the burden of meeting growing demand will fall heavily on the primary industry. Yet not only is this sector smaller, but also lead is usually only a co- or by-product of zinc at mines, which results in market rigidity. Moreover, there is comparatively little scope for growth in mine production from restarts of capacity closed in H2 08 and H1 09 because the cutbacks were relatively small. We estimate that outside China, the mine cuts and closures came to only about 220ktpa of annual lead capacity, or just 6% of 2008 world production compared with about 10% in the case of zinc and over 20% for nickel. Few of the lead cuts have yet been reversed, but restarts in the disproportionately large (and hard to track) Chinese industry were already under way by Q2 09. We now estimate that world lead mine output will have declined by only about 1.5% in 2009.

World lead mine production, mt – limited swing then limited growth



Source: CRU, ILZSG, RBS forecasts

This said, in addition to the likely reactivation of much of the capacity closed in 2008-09, lead-only **Magellan** in Australia (90ktpa and shut for entirely different reasons) looks set to reopen in 2010. **Mount Isa**, also in Australia, should raise output by at least 40kt, while the few new mines include lead-rich **Peñasquito** in Mexico (80-90ktpa). Nevertheless, we forecast that global lead mine production will rise by 3% at most in 2010 to little more than the level of 2008.

Primary refined production is following a slightly different path. Even excluding China, market-driven lead smelter cutbacks in 2008-09 amounted to about 275ktpa, and although some of the hefty cuts in China have been unwound, they were then offset by the pollution-related closures. We now estimate that world output will have dropped by about 4.5% in 2009. But this leaves scope for a stronger recovery than at the mine level in 2010. There will certainly be no shortage of capacity, especially if, as looks increasingly likely, **La Oroya** in Peru (120ktpa) restarts. Our forecast is that world primary refined lead output will bounce by about 4% in 2010, although a more pedestrian performance by the bigger secondary sector may confine overall production growth closer to 3.5%.

Selected price-related production cutbacks in the lead industry since mid-2008; reactivations highlighted in red

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Mines			
Lennard Shelf, Teck/Xstrata, Australia	Implemented August 2008	Early closure of ~20kt/y mine	
Hellyer, Intec, Australia	Implemented September 2008	Closure of ~15kt/y mine	
Broken Hill, Perilya, Australia	Implemented September 2008	Cut by 2kt/y from 07/08 level of 52kt	Closure of North mine but head grade up
Golden Grove/Scuddles, OZ Minerals, Australia	Announced September 2008/January 2009	To cut Golden Grove, then close Scuddles	Total cut ~5kt/y
Endeavor, CBH Resources, Australia	Announced October, November 2008	To cut to ~15kt/y from plan of >30kt/y	Plans return to full output by mid-2010
Caribou/Restigouche, Blue Note, Canada	Implemented November 2008	Closure of ~20kt/y operation	
Aljustrel, Lundin Mining, Portugal	Implemented, November 2008	Closure, was to build up to 18kt/y	
Minera Rosaura, Perubar (Glencore), Peru	Implemented November 2008	Closure of small mine	
Century, OZ Minerals, Australia	Announced November 2008	To cut 2009 production by 4%, ~2kt	
McArthur River, Xstrata, Australia	Announced December 2008	To cut 2009 production by 20%, ~7kt	
Pend Oreille, TeckCominco, US	Announced December 2008	To close 5kt/y mine in February 2009	
ShalkiyaZinc, Kazakhstan	Announced December 2008	To close 18kt/y mine	
SE Missouri, Doe Run, US	Announced January 2009	To cut by ~17%, ~38kt/y	Started to raise output in October 2009
Cerro de Pasco, Volcan, Peru	Announced January/April 2009	Closed open-pit section, cut ~20kt/y	Restarting from September 2009
Galmoy, Lundin, Ireland	Announced January 2009	To close ~20kt/y mine early, May 2009	
Iscaycruz, Glencore, Peru	Implemented March 2009	Closure of 15kt/y mine	
Smelters/refineries			
Anyang Yubei, China	Implemented July 2008	Cut by ~30kt/y for seven months	Back at full production Feb 09
Zhen Xing, China	Implemented August 2008	Cut by ~30kt/y	Mainly due to concentrate shortage
Huludao, China	Implemented October 2008	Cut by ~10kt/y at ISF plant	
Yuguang Gold, China	Implemented November 2008	Closed 100kt/y plant	
Herculaneum, Doe Run, US	Implemented November 2008	Cut by about 18kt/y 12-13% of capacity	
Xinling Refining, China	Implemented November/December 2008	Cut by 60kt/y, then shut100kt/y plant	Restarted at 50% Feb. 09, 75% April
Chigirishima, Toho Zinc, Japan	Announced December 2008/March 2009	Cut by annualised ~21kt/y for Q1-Q2 09	
Harima, Sumitomo, Japan	Announced January 2009	Cut by ~15%, annualised ~5kt	Cut through H1 09
Plovdiv, KCM, Bulgaria	Announced January 2009	To cut by ~12%, 8kt/y	
Copsa Mica, Mytilineos, Romania	Announced January 2009	To close 22kt/y smelter	
La Oroya, Doe Run, Peru	Implemented March/June 2009	Forced to cut then close 120kt/y plant	Due to financial/environmental problems
Baton Rouge, Exide, US	Announced March 2009	To close 60kt/y secondary plant	Has been producing at only ~30kt/y
Portovesme, Glencore, Italy	Announced June 2009	Temporarily closed 80kt/y plant	

Source: Company reports, Reuters, Bloomberg, RBS

The situation may become more challenging post 2010. The key sources of mine production growth in 2010 should continue to contribute in 2011, but they will be countered by the exhaustion of 70ktpa **Brunswick** in Canada. The pipeline of committed new lead-producing mines and expansions in 2011-13 is thin and the list of uncommitted projects standing a realistic chance of coming onstream in the period is short. We forecast that world lead mine output will increase by less than 4% pa between 2010 and 2013. Coupling this with trends in the secondary sector, we conclude that growth in overall refined lead production between 2009 and 2013 will be barely 4% pa. There will then be a bunching of mine closures in 2014-15, including **Century** (Australia) and possibly **Paragsha** (Peru).

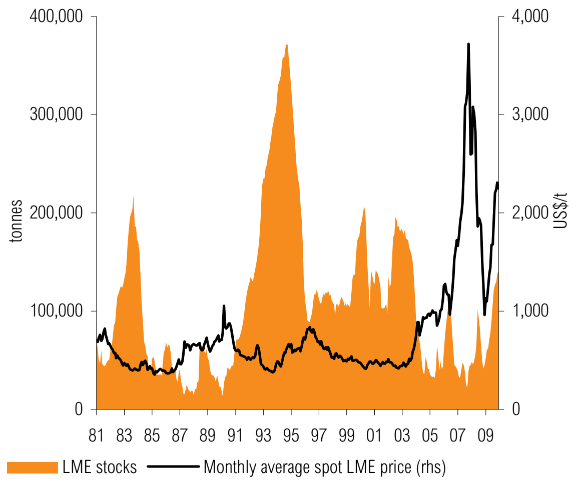
One new primary smelter is due to be commissioned in each of Brazil and India and there will be more widespread, smaller capacity increments in the secondary sector. But most of the increase in world refined lead production in 2010-13 will have to come from China. Capacity there is already ample with more planned, so the question is how much the authorities will allow to be produced. They may well force the pace of permanent closures of old, dirty plants, even after the introduction of relatively undemanding emission standards, but our judgment is that they will permit domestic production to continue to grow at a solid pace **provided the country does not thereby return to having an exportable surplus**. If so, it is likely that China's share of global production will soon rise above 40%. This must be some concern in light of recent events.

Outlook – return to severe tightness by 2013

We believe the lead market faces the prospect of returning to the fundamental tightness of 2006-07 by 2013. It is not the slow-growing market of past decades, even if demand for lead is less cyclical than that for other metals. Secondary production cannot on its own satisfy all the additional demand through the cycle and the primary sector is hampered by lead's by-product status in most of the mining industry. It is hard to see mining companies collectively retooling to prioritise lead any time soon. We forecast a cumulative underlying deficit in 2011-13 of up to 450kt, which may take the reported stocks to consumption ratio down to just 1.5 weeks, even if much unreported inventory resurfaces.

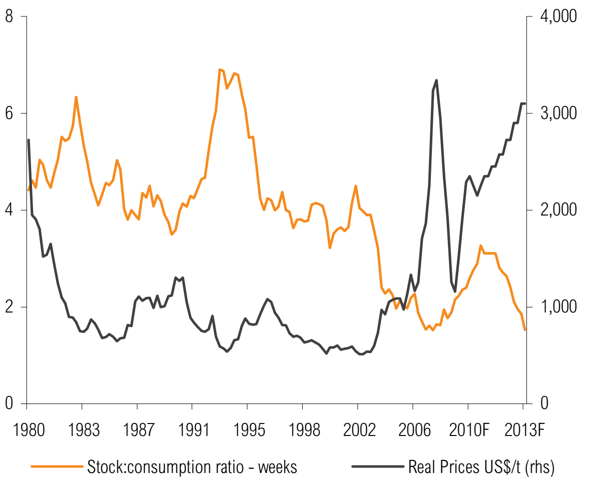
As to the shorter-term future, reported stocks may continue to rise over the next 12 months, especially if the off-market inventory that we believe has built up in China in 2008-09 begins to trickle back into the market. But despite the sharp rise on the LME in 2009, overall reported inventories remain historically low, and we do not expect the stock: consumption ratio to escalate even to the levels of 2002 before it starts to decline. Although the transition to supply deficit may be from a higher level of stocks and may begin a little later than we forecast last time, we expect inventories to be eroded very rapidly in 2012-13.

LME lead inventories and spot lead price – stocks up sharply but still historically low



Source: LME, RBS

Lead stock:consumption ratio and real price – ratio to fall back sharply, price to rocket further in 2011-13



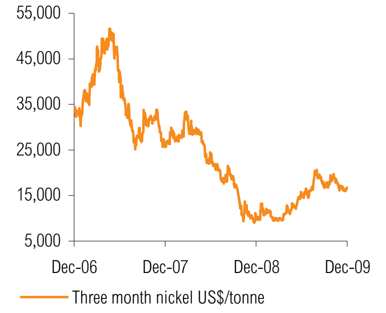
Source: LME, ILZSG, CRU, RBS forecasts

Even after its outstanding recovery in 2009, we believe the outlook for the lead price remains bullish. The two brief spikes in H2 09 to about US$2,500/t may be just a taste of what is to come. Although the absolute peak of the last bull market (near US$4,000/t) may still be out of reach in our time horizon, we forecast that the annual average LME cash price will hit a new record high in 2012 of US$2,800/t, then race on to US$3,100/t in 2013. There may well be a period of correction during 2010 (even though we expect it to be the year in which the mean price registers its largest yoy gain this cycle). But we believe the biggest risk to our forecast profile is that price escalation will be brought forward as investors anticipate severe market tightness.

Nickel

Woe, woe and thrice woe – still in a pickle

Nickel price succumbing to rising tide of inventory and alas supply



Source: LME

In our October Commodity Companion, we relegated nickel to the wooden spoon position among the base metals as the metal with the least favourable market outlook. Key was that its price recovery this year was too fast, too early and vulnerable to collapse. This indeed transpired, with nickel experiencing a 25% decline from its August 2009 high of US$21,225/tonne (US$9.63/lb) to US$16,000/tonne by early December. We have not changed our stance and nickel remains our least preferred commodity exposure for 2010.

Nickel faces a potent and not easily eradicated legacy of this recession and must confront three key issues: **1)** how to erode 0.145mt of LME inventory now at 15-year highs with total reported stocks of over 14 weeks of demand (and if the Chinese 0.150mt of inventory is included, this rises to an horrendous 20 weeks). Remember that back in February 2007, LME nickel stocks of a meagre 2,982 tonnes were sufficient for just eight hours of concurrent world demand; they are now equivalent to 43 days of demand; **2)** how to manage the reactivation of the remaining 0.285mtpa, or 20%, of world nickel capacity, much of which is now cash positive; and **3)** how to cope with a parade of new and expanded nickel mines due onstream over 2010-13, which we estimate will add 0.600mtpa of contained nickel capacity.

The good news is that after an unprecedented three consecutive years of contraction, stainless steel demand should rebound strongly over the next few years. We forecast that both stainless steel and finished nickel demand will snap higher in 2010 and beyond as the business cycle gets into its stride. A 2009 nickel price average of US$14,585/tonne will be 60% lower than in 2007 prior to the crisis. We forecast another two years of supply surplus ahead and have pencilled in a 2010 average price barely changed yoy at US$14,750/tonne.

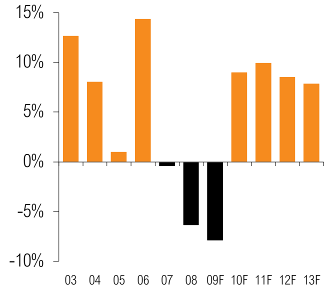
RBS world nickel market supply/demand balance, 2006 -13F; another weak year in store, hurt by supply surplus

000 tonnes	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World stainless steel production, mt	**28.45**	**28.30**	**26.50**	**24.40**	**26.60**	**29.25**	**31.75**	**34.25**
% change yoy	**14%**	**-1%**	**-6%**	**-8%**	**9%**	**10%**	**9%**	**8%**
of which China	5.30	7.28	6.90	8.50	9.75	10.75	12.50	13.75
% change yoy	44%	37%	-5%	23%	15%	10%	16%	10%
of which Europe	9.56	8.36	8.08	6.00	6.50	6.75	7.50	8.00
% change yoy	12%	-13%	-3%	-26%	8%	4%	11%	7%
of which US	2.50	2.17	1.93	1.70	2.00	2.15	2.25	2.35
World finished nickel production	**1,345**	**1,430**	**1,385**	**1,325**	**1,420**	**1,520**	**1,600**	**1,685**
Change %	**5.1%**	**6.4%**	**-3.3%**	**-4.3%**	**7.0%**	**7.0%**	**5.5%**	**5.0%**
of which China	136	205	192	250	265	280	300	300
% change yoy	39%	51%	-6%	31%	6%	6%	7%	0%
of which Russia	275	268	258	242	255	265	270	280
of which Canada	156	162	176	120	150	150	140	140
of which Japan	150	158	154	138	145	160	175	180
Disruption allowance ~5%pa	*-*	*-*	*-*	*20*	*70*	*75*	*80*	*90*
World finished nickel consumption	**1,405**	**1,340**	**1,275**	**1,250**	**1,375**	**1,485**	**1,625**	**1,735**
Change %	**12.0%**	**-4.5%**	**-5.0%**	**-2.0%**	**10.0%**	**8.0%**	**9.5%**	**7.0%**
of which total Asia	690	705	680	750	800	880	1,000	1,100
of which China	260	345	350	450	475	525	600	700
% change yoy	41%	32%	2%	28%	6%	11%	14%	17%
of which Europe	490	425	410	340	365	395	425	450
% change yoy	8%	-13%	-4%	-17%	7%	8%	8%	6%
Implied market balance	**-60**	**90**	**110**	**75**	**45**	**35**	**-25**	**-50**
Reported stock	155	200	255	340	385	400	360	285
Stock: consumption ratio (weeks)	**5.7**	**7.8**	**10.4**	**14.0**	**15.0**	**14.0**	**11.5**	**8.5**
LME spot nickel US$/tonne	**24,275**	**37,167**	**21,020**	**14,585**	**14,750**	**17,000**	**19,250**	**23,000**
LME spot nickel US$/lb	**11.00**	**16.86**	**9.53**	**6.62**	**6.70**	**7.70**	**8.75**	**10.45**
Change %	65%	53%	-43%	-31%	1%	15%	13%	19%

Source: CRU, WBMS, LME, INSG and RBS forecasts

Demand – prepare for stainless steel rebound

Swings in annual world stainless steel growth, 2003-13F (%)



Source: CRU and RBS forecasts

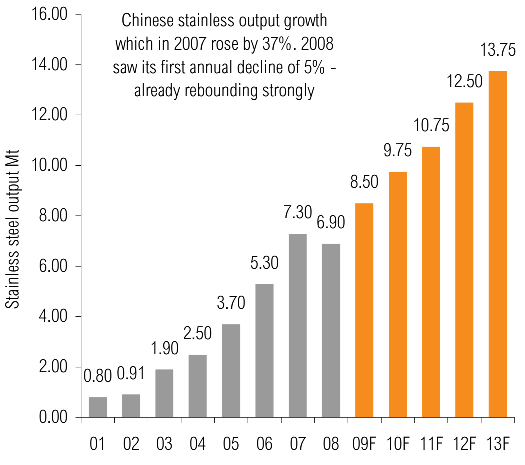
Austenitic stainless steel (with a nickel content of at least 7%) is nickel's key end-use demand sector, accounting for about 65% of world refined nickel demand. Non-stainless steel applications include nickel super-alloys in aerospace, castings and in batteries. Typically, stainless steel production has grown at a trend rate of about 5% pa. Growth rates yoy, however, exhibit wide swings, reflecting stocking and destocking cycles and periods of capacity additions and cutbacks. After the flurry of excitement in the summer months, stainless steel markets have relapsed into Q4 09 in the face of weak underlying demand with distributors adopting a cautious stance and awaiting for significant improvement in 2010. Indeed, we suspect that Chinese mills will not be active in the market until after the mid-February Chinese New Year of the Tiger holidays are over.

Three traumatic years have seen world stainless steel production contract in 2007-09 by 14%, or 4mt. Indeed, 2009 was the worst year with an estimated 8% yoy decline representing a 2.1mt loss to 24.40mt – the lowest in six years. Losses would have been much greater had it not been for a 23% rise in Chinese stainless output to a record 8.50mt. Hard-hit Europe tumbled by 26% to just 6mt, the lowest level this decade.

Our chart below of the European cold-rolled CR304 stainless steel price against spot nickel shows all is not well with the CR304 price, which hit a 2009 high in August of US$1,325/tonne and has since tumbled 21% to US$1,050/tonne. Seven of China's largest stainless steel producers have had to reduce output due to oversupply. Meanwhile, European mills are operating at a low 58% of melt capacity, despite more robust offtake from the automotive sector as a result of the various cash-for-clunkers schemes.

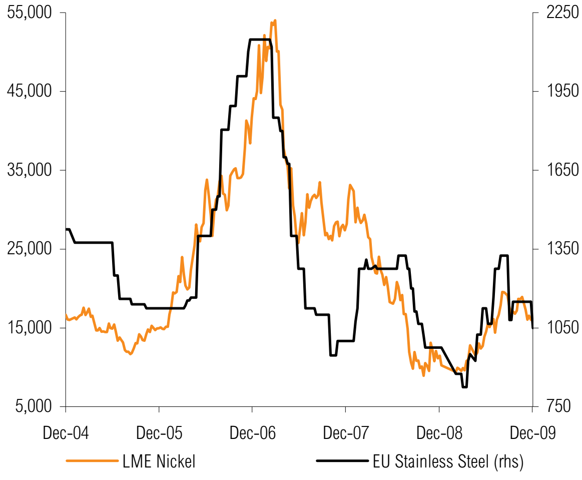
As our below left chart shows, China looks set to continue its aggressive stainless steel expansion and by 2013 we forecast China will account for 40% of world stainless steel production. We expect CAGR growth from China of 13% pa through to 2013, when we forecast Chinese output will have added 5.25mt to 13.75mt. Other key producers will not be far behind and given stainless steel's leverage to world growth plus the base effect of three years of contraction, we forecast an above trend 9% rise in 2010 in world stainless steel output to 26.60mt and a further 10% rise in 2011 as European growth gets more into its stride. Between end 2009 and 2013F, we have pencilled in an additional 9.85mt of world stainless output with a CAGR of nearly 9% pa.

Chinese stainless steel production declined 5% in 2008, but has risen sharply on reactivation



Source: CRU, and RBS estimates

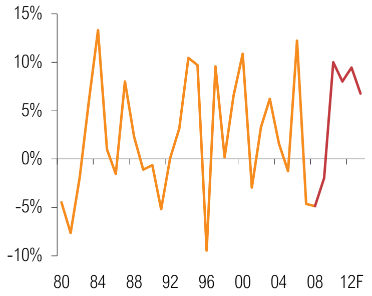
LME nickel price and stainless steel CR304 prices. Q3'09 strength has unravelled – not looking good



Source: Metal Bulletin, LME and RBS

World nickel demand gearing up for a rebound in 2010-13F

Change in yoy world primary nickel demand. Set to snap higher



Source: CRU, WBMS and RBS forecasts

A harrowing three years for world refined nickel demand is about to come to a close. A slump in world stainless steel offtake has translated into markedly lower nickel offtake. We estimate that over the 2007-09 recession period, there was an 11% decline in nickel demand, representing the loss of 0.155mt of nickel. The good news is that history shows us that stainless steel and hence refined nickel consumption are strongly correlated to world GDP growth. RBS forecasts that in 2010 and 2011, world GDP growth will rise by 4.1% and 4.4%, respectively, with robust 9% pa growth in nickel's biggest consuming market, China.

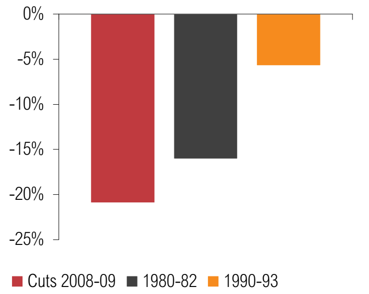
Since our October review, we have received further evidence that China's voracious demand for nickel has intensified. We now estimate that Chinese nickel demand in 2009 will rise not by 14% yoy, but by 28% to a record 0.450mt. In this recession year, China has been able to increase its share of world nickel consumption to a record 36% and there's much more to come yet. Some of this rise is apparent demand associated with restocking and will drop out in 2010.

Nickel has been no exception to China's thirst for imports. Data from the Chinese General Administration of Customs for January-October shows that net refined nickel imports were a record 0.202mt. These imports are nearly double the entire 2008 imports of 0.112mt. But in common with other commodity imports such as copper and aluminium, we note that net nickel imports slumped in October by 68% mom to just 5,478 tonnes – the lowest in nearly 30 months. That October import figure compares with the record July 2009 import high of 43,481 tonnes. China has likely restocked and is now awash with metal. We have to hope stainless steel production growth in the years ahead is as strong as we forecast.

We forecast that 2010 will see increased activity by the world's austenitic stainless mills, led by China. Following a decline of 2% in world nickel demand in 2009 to 1.25mt, we still expect a 10% increase in world nickel demand in 2010 to 1.375mt, requiring an additional 0.125mt of metal. China will remain the driving force, but nickel will benefit from rebounding nickel demand growth from Japan (down 29% over the past three years) and Europe (off 30% over the same period). By 2013, we forecast Chinese nickel demand will have risen to 0.700mt, or 40% of all nickel consumed. Over the 2010-13 period, we forecast world nickel consumption will rise by 0.485mt, a CAGR of 8.5% pa.

Supply – reactivation and new capacity parade

Nickel mine production cuts, at 21%, exceed previous recessions

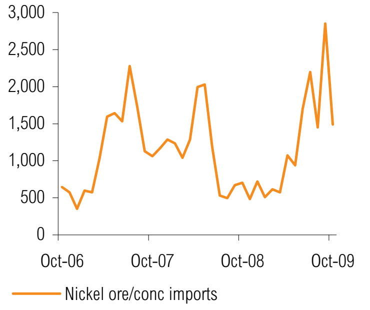


Source: Company sources and RBS

Just as you thought things could not get any worse for nickel, they did. Since our October review, supply side woes for nickel have grown in magnitude. Even the ongoing five-month labour strike at Vale's Canadian operations and reduced output have been unable to turn sentiment. Mining companies, aware of the lead times for new projects, have to press the green button to get projects under way, often just when the market outlook looks at its most depressing. Such an example was the mid-December news that First Quantum had bought the mothballed Ravensthorpe nickel mine from BHPBilliton. In the case of nickel, we continue to view 2010 and 2011 as dismal supply surplus years for the nickel market and price, but by 2012-13F, a rosier picture emerges. Nickel supply to the market will come from two key areas.

1) Reactivation of idled capacity – we estimate that at its peak, low price and weak demand induced closures of nickel capacity totalled about 0.320mtpa, or 21% of world production, and the greatest capacity curtailment of any of the base metals. As our sidebar chart shows, these closures eclipsed those of the 1990-93 recession of about 6% and the 16% seen in the severe 1980-82 recession. To be fair, producer discipline has been admirable with just 0.030mtpa of reactivation thus far, but we see this as the calm before the storm, with reactivation likely to be a key theme for nickel over the next few years.

Rapid recovery in imports of low grade ore to China for NPI, 000t



Source: Chinese Gen Admin of Customs

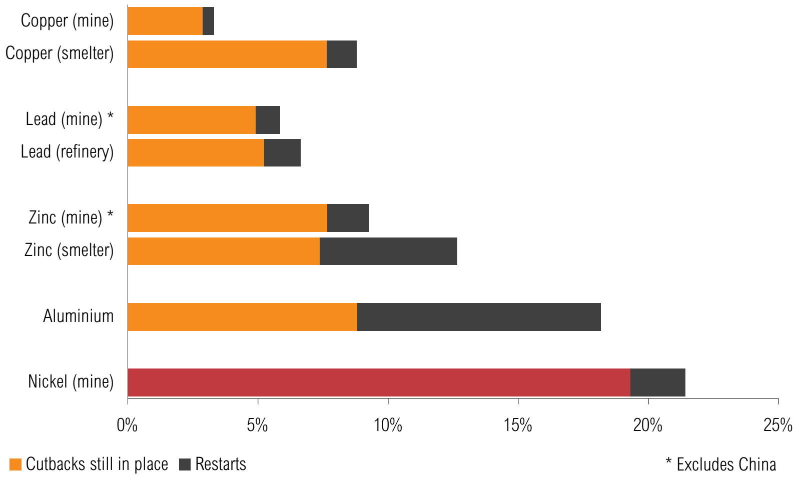
2) New and expanded capacity additions – We estimate that nickel mine capacity additions in 2009-13F could total 0.600mtpa of contained nickel. This capacity will embrace nickel sulphides and laterite high-pressure acid leach projects, as well as Chinese nickel pig iron (NPI) producers.

NPI production costs have fallen significantly. Basic high-cost NPI blast furnaces have been upgraded, with more efficient electric arc furnaces that can produce a product suitable for both 200 and 300 series stainless steel production. Also, lower energy and freight costs are a fraction of what they once were (though we expect coal prices to continue their rise). Imports of low-grade limonite ores from the Philippines, Indonesia and New Caledonia to China have this year rebounded to fresh records with imports in January-October 2009 up 6% yoy at 11.87mt. Estimates of Chinese NPI production costs over the past two years have fallen from US$22,000-30,000/tonne (US$10-14/lb), to US$11,000-18,000/tonne (US$5-8/lb). We expect NPI to pinch and swell with the price cycle, but to contribute at least 100,000tpa to nickel market supply in the years ahead.

Outside of reactivation remains a parade of new and expanded projects. The big projects to watch out for are Vale's 60,000tpa **Goro** and its 50,000tpa **Onca-Puma** in Brazil. Also in Brazil, Anglo American's 36,000tpa **Barro Alto** mine is nearing completion and is scheduled to come onstream in Q1 11, with full production by Q3 12. In Europe, increases at **Norilsk** should add at least 35,000tpa, while **Talvivaara's** new mine in Finland will reach 30,000tpa in 2010 with plans to expand to 50,000tpa post 2012. Mirabela's 24,000tpa **Santa Rita** mine in Brazil has now started production.

Japan's largest nickel producer Sumitomo Metal Mining will start construction in March 2010 of its 30,000tpa **Taganito** nickel-cobalt project in the Philippines. Taganito will use a high-pressure acid leach process and is scheduled to be onstream in August 2013. Vale's 46,000tpa **Vermelho** project still looks to be post 2013. Work on Xstrata's 60,000tpa US$3.85bn **Koniambo** project, the world's highest grade laterite resource, is well advanced. Xstrata expect C1 cash costs of just US$2/lb (US$4,400/tonne) with a mine life of over 50 years. Finally, First Quantum in December announced that it has bought BHP Billiton's mothballed 50,000tpa **Ravensthorpe** mine. After an 18-month ramp up, First Quantum plan to produce 39,000tpa for the first FIVE years and 28,000tpa over the mine's 32-year lifespan. First production will likely be in H212. C1 cash breakeven costs were estimated at US$5/lb (US$11,000/tonne). This will be a closely watched project.

Of all the base metals, nickel has the most idled capacity waiting in the wings for reactivation. We estimate 0.285mtpa of capacity remains idled.



Source: Company releases and RBS

Selected price-related production cutbacks in the world nickel industry since mid-2008 (red indicates reactivation)

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Acoje, Rusina/DMCI, Philippines	Implemented June 2008	Closed ~6kt/y mine	Ore for Chinese NPI
Falcondo, Xstrata, Dominican Republic	Implemented August/December 2008	Closed 30kt/y plant for four months	Then indefinitely
Ufaleynickel/Reznickel, Ind. Met. Hdgs, Russia	Implemented August/October 2008	Cut by ~5kt/y, then closure of ~15kt/y	Partial restart in February 2009
Jinchuan, China	Implemented October 2008	Cut 2008 target output by 20kt, cut by 33%	
Yuanjiang Nickel, Sino-Platinum Metals, China	Implemented October 2008/January 2009	Closure of 5kt/y plant	
Shakespeare, Ursa Major, Canada	Implemented October 2008	Closure of new 4kt/y mine	
Cawse, Norilsk, Australia	Implemented October 2008	Closure of ~9kt/y mine	
Lockerby, First Nickel, Canada	Implemented October 2008	Closure of ~2kt/y mine	Aim to raise capacity towards 10kt/y
Levack/McCreedy West, FNX, Canada	Implemented October/December 2008	Closed Levack, then McCreedy West	Combined capacity ~6kt/y
PT Inco, Vale, Indonesia	Implemented October 2008	Cut of 20% at 78kt/y operations	
Onca Puma, Vale, Brazil	Announced October 2008/April 2009	Start-up of 58kt/y mine postponed to 2011	
Goro, Vale, New Caledonia	Announced October 2008	Delay in start-up and build-up to cap.	On stream start 2010, capacity to be
Eramet, New Caledonia	Announced October 2008	To cut 2009 target output from 62kt to 50kt	
Dalian, Vale, China	Announced October 2008	To stay at 35% utilisation of 32kt/y plant	
Berong, Toledo Mining, Philippines	Implemented November 2008/February 2009	Mine cut back, then closed, 2008 output	Was to expand to ~15kt/y
Copernicus, Panoramic Res. et al, Australia	Implemented November 2008	Mine closed before reaching cap. of 2kt/y	
Black Swan/Waterloo, Norilsk, Australia	Implemented November 2008/February 2009	All closed in stages, combined cap. ~15kt/y	Black Swan o/p closed Feb 09
Trojan/Shangani, Bindura Nickel, Zimbabwe	Implemented November 2008	Closure of mines (5kt/y), smelter (~10kt/y)	
Craig/Thayer-Lindsley, Xstrata, Canada	Announced November 2008/February 2009	To close both mines early, Feb 2009	Capacities were 6kt/y and 3kt/y
PT Aneka Tambang, Indonesia	Announced November 2008/February 2009	To cut by cumulative ~7kt	Back towards full prod Nov 09
Miitel, Mincor, Australia	Implemented December 2009	Closed 5kt/y mine	
Copper Cliff South, Vale, Canada	Announced December 2008	To close ~8kt/y mine	
Voisey's Bay, Vale, Canada	Announced December 2008	To close for one month in July 2009	Loss, ~5kt
Hitura/Sarkiniemi, Belvedere Resources, Finland	Implemented December 2008	Both mines closed, combined capacity 3kt/y	
Avebury, OZ Minerals, Australia	Announced December 2008	To close, was to produce 8kt/y	China Metals may restart
Niihama/Hyuga, Sumitomo, Japan	Announced January 2009	Cut annualised combined 15kt in Q1-Q4 09	9kt at Niihama, 6kt in FeNi at Hyuga
Loma de Niquel, Anglo American, Venezuela	Announced January 2009	To close temporarily 17kt/y mine	
Ravensthorpe, BHP Billiton, Australia	Announced January 2009	Closed 50ktpa	First Quantum to restart by 2011F
Fraser/Fraser Morgan, Xstrata, Canada	Announced February 2009	To close Fraser, defer Fraser Morgan	Fraser Morgan target cap. 8kt/y
Lake Johnston complex, Norilsk, Australia	Implemented February 2009	Closing mining complex with cap. ~14kt/y	
Munali, Albidon, Zambia	Implemented March 2009	Closed 10kt/y mine	Jinchuan to restart January 2010
Ferronikeli, Kosovo	Implemented March 2009	Cut by 50% at ~10kt/y operations	Started to reverse cutback in Q3 09
Larco, Greece	Announced April 2009	Cutting 2009 prod by ~40% at 18kt/y ops.	
Sinclair, Xstrata, Australia	Announced April 2009	To close 6kt/y mine in August 2009	If market conditions do not improve
Sudbury operations, Vale, Canada	Announced April 2009	To close for 8 weeks in June/July 2009	In addition to maintenance closure in May
Rocky's Reward (Leinster), BHP Billiton, Australia	Announced May 2009	To close one of three mines at Leinster	Leinster capacity ~35kt/y
Santa Cruz, Semirara Mining, Philippines	Announced July 2009	Closed new mine with target cap ~10kt/y	
Chinese nickel pig iron industry		Big cuts and closures across industry	Most capacity restarted from Q2 09

Source: Company reports, Reuters, Bloomberg, RBS

Convoy of new, reactivating and expanding nickel mines are due on-stream by 2013F (20,000tpa cut-off used)

'000 tonnes	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**	**2009 - 13F**
Goro – Vale, New Caledonia	0	20	35	45	60	60
Onca Puma – Vale, Brazil	0	0	15	30	50	50
Barro Alto – Anglo, Brazil	0	0	10	25	45	45
Koniambo – Xstrata, New Caledonia	0	0	0	15	35	35
Norilsk – Russia	121	132	140	150	155	34
Ramu River – CMCC/Highlands PNG	0	10	15	25	30	30
Ravensthorpe – First Quantum, Australia	0	0	5	25	30	30
Talvivaara – Finland	8	25	30	35	35	27
Santa Rita – Mirabela, Brazil	1	15	25	25	25	24
SLN/Eramet – New Caledonia	58	63	70	80	80	22
Raglan – Xstrata, Canada	28	30	35	45	48	20
Caldag – European Nickel, Turkey	0	1	12	16	20	20
Forrestania – Western Areas, Australia	10	15	22	25	30	20
Ambatovy – Madagascar	0	0	5	15	20	20
Forrestania – Western Areas	10	15	22	25	30	20
Soroako – Vale, Indonesia	70	65	70	85	90	20
Total planned world mine production	**1,370**	**1,545**	**1,675**	**1,815**	**1,970**	**600**
Total yoy	**-105**	**175**	**130**	**140**	**155**	

Source: Company reports, News wires, CRU and RBS

China now the biggest finished nickel producer heading to 0.300mtpa

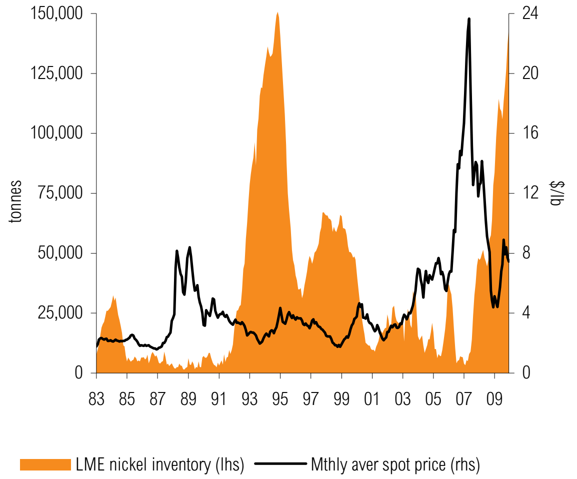
World refined nickel supply fell by over 4% in 2009 to 1.325mt – the lowest output in four years and the second consecutive year of supply contraction. Between end-2007 and end-2009, we estimate that plunging prices caused world nickel supply to contract by 8%, wiping 0.107mt off supply. Russia, Japan and Canada suffered the greatest contraction. But there has been a startling exception, China. Chinese output has been on a strongly rising trend and in 2009 we forecast will rise a substantial 31% yoy to a record 0.250mt. Jinchuan and Chinese nickel pig iron account for the lion's share of the production surge, augmented by small scale Chinese producers. We have reorganised our balance table to show for the first time Chinese output, which is on course by 2012F to reach 0.300mtpa nearly 20% of world refined output.

Our price profile, notably post 2011, and the rebound in stainless steel production suggest to us that the next few years will see unrelenting supply additions. There will be a combination of reactivation of capacity currently held in a state of suspended animation and new projects which are so close to completion that they are virtually unstoppable. We forecast output in 2010 will rise by nearly 0.100mt, or 7%, to 1.420m t and in 2011 by a further 7%, to 1.520mt. By the end of 2013, we estimate 0.360mt of additional supply will have been brought onstream, representing a CAGR of 6.2% pa. Do note that these totals include our 5% pa supply disruption allowance for losses due to strikes, plant failure etc, which amounts to 0.070mt in 2010 and 0.090mt in 2013.

Outlook – worst market outlook of the base metals

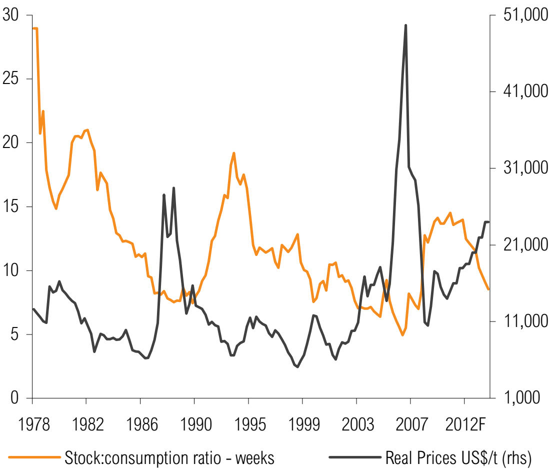
In our October *Commodity Companion*, we relegated nickel to our least preferred commodity exposure, a position it maintains. Stainless steel, nickel's biggest end use market, has struggled to maintain traction, with world production down for an unprecedented third year. High frequency inventory data in the form of the daily LME warehouse inventory report has been a constant reminder of how dismal the nickel market has become. LME warehouse stocks of nickel have risen almost 20% since our October review and at over 145,000t are just a whisker away from their record high of 151,254t seen in November 1994 (when the price was 35% lower in real terms than now). It's a sobering statistic that in February 2007, LME nickel inventory hit a 16-year low of a meagre 2,982 tonnes. Taking into account cancelled warrant, free stock available was enough for just eight hours of concurrent world nickel consumption. Today, stocks are at 15-year highs and equivalent to 43 days of consumption.

Hefty nickel supply surplus has seen LME warehouse stocks rise to the highest levels in 15 years



Source: LME and RBS

Nickel stock:consumption ratio and real price – a huge stock overhang, with over 12 weeks of stock

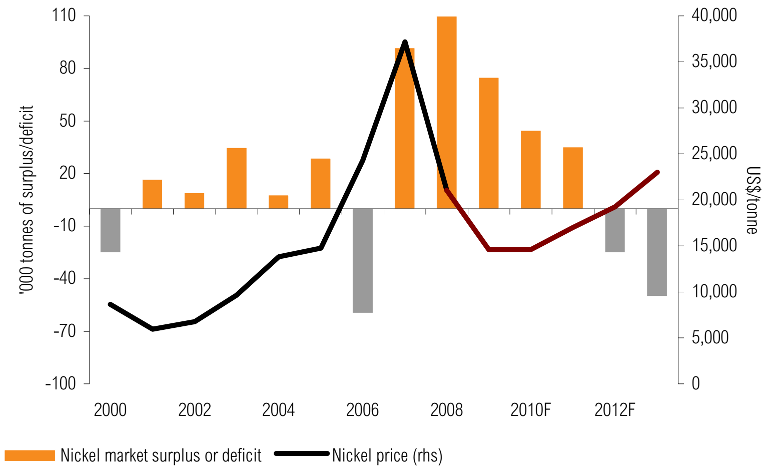


Source: LME, CRU and RBS

Of course we need to view inventories not only in absolute terms, but also to take account of a higher consumption base, hence we also look at the stock: consumption ratio in terms of weeks of inventory. This too has blown out. We estimate that the upward move in reported LME, producer and consumer inventory since the demand slump began in 2007 has already been 0.185mt. Expressed in terms of the stock consumption ratio, the stock ratio ended 2006 at a critically low 5.7 weeks and by end-2009, we estimate that the stock ratio will be at 14 weeks – a level we envisage it holding for the next two years.

We view six weeks of stock as the ideal comfort level for nickel, equivalent to 0.145mt of metal against the end-2009 level of 0.340mt. That means that as nickel enters the new decade, it needs to erode 0.195mt of inventory or nearly eight weeks of stock. But there's more. **We also estimate that China has built an internal nickel stockpile of about 0.150mt, a large proportion of which could be liberated into the market in 2010**. Throw that into the equation and stocks are closer to 0.500mt, or 20 weeks of stock. We are concerned that in January 2010, China may remove the 15% export tax duty payable on refined nickel to ASEAN countries, leading to a deluge of metal from China (as well as lower imports) and undermining nickel price sentiment.

Cumulative nickel surplus between 2007-11F a hefty 0.360mt. By 2012F demand growth will generate first supply deficit in 6 years.



Source: CRU, LME and RBS forecasts

The cumulative implied world nickel supply surplus between 2007 and 2011 will be a hefty 0.360mt. We forecast that new supply will comfortably outpace even our robust nickel demand growth forecast for 2010 and 2011. As a result, supply surplus will remain a burdening theme and we believe fresh record high inventories seem inevitable. Indeed, we still forecast the nickel price will relapse in 2010, with at least 15% potential downside from current levels. Only by 2013 do we forecast a 0.050mt supply deficit and a stock ratio of 8.5 weeks, when nickel should be able to consistently trade above the US$20,000/tonne marker.

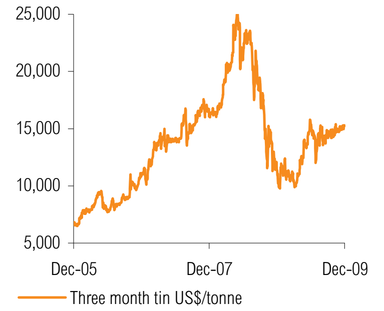
Our 2009 spot average of US$14,585/tonne is less than 1% below our October forecast. However, we have downgraded our 2010 spot price forecast by 5% to US$14,750/tonne (US$6.70/lb) and 2011 by 3% to US$17,000/tonne. These changes are essentially lost in the rounding when one considers nickel's reputation for being one of the most price volatile metals. By 2012, we forecast annual price averages will be demonstrably higher when demand growth finally burns off supply additions and the first supply deficit in five years appears. By 2013, we have maintained our price average of US$23,000/tonne (US$10.45/lb). All in all, a long hard slog for nickel, with much risk surrounding its outlook. Other metals, such as copper, offer much more compelling fundamentals, in our view.

Tin

Catch-up delayed but not cancelled

Stuck near US$15,000/t with the big backwardation having dissipated, tin's price recovery still lags behind those of most base metals. But this has more to do with its higher starting point relative to past lows and the fact that it is not a constituent of key commodity indices than with relative fundamentals. Though large, tin's underlying surplus in 2009 has not been markedly worse than most and is now, we believe, more or less over. After three dire years, we expect tin to post a particularly strong cyclical rebound in demand in 2010 of 10%. Producers may struggle to keep up and supply constraints similar to those for other metals may lead to growing market tightness from 2011. Nevertheless, we now feel that tin may have to wait until late 2010 before it begins to catch up and the LME price establishes itself firmly above US$15,000/t.

Tin has continued to lag behind; backwardation drama over

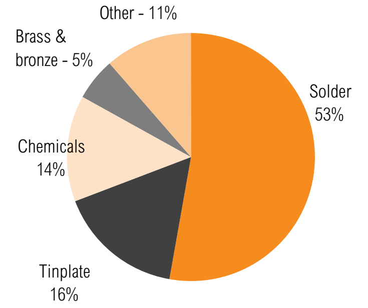


Source: LME

Demand to rebound strongly after three dire years

It would appear world tin demand was even weaker in H2 08 and H1 09 than we thought last time. Following a 15% slump in H2 08, demand may have collapsed by 25% yoy in H1 09 to its lowest first-half total since 2002. Even in 2008 it was barely higher than in 2005, before the introduction of EU regulations curbing the use of lead-containing solder. Dire though tin's performance has been, it should be noted that our figures refer to *apparent* demand, and it is clear that the collapse since 2006, and especially in Q4 08 and H1 09, involved massive consumer destocking. We believe this had run its course by mid-2009, while there have since been signs of an improvement in underlying demand.

World tin demand by first use – dominated by cyclical solder



Source: ITRI, RBS

Solder (over 50% of total tin demand, the vast bulk of it in Asia) has been at the forefront of recent developments, not only the destocking and the weakness of actual usage, but also the improvement of the last few months. We expect a strong cyclical rebound in solder demand in 2010. Most other uses, especially tinplate, are less cyclical so may not grow as strongly. But some sectors have shown a vigour in 2009 that may well continue, notably tinplate chemicals and paint cans, glass and chemicals (largely due to improved cost-competitiveness). The dreadful first half means we now estimate that world tin demand will plunge by 8-9% in 2009. However, with demand down 15% since 2006 to its lowest level since 2003, in a market with a pretty solid set of uses and several growth areas, we expect it to snap back in 2010. We forecast growth of 10%.

RBS world tin market supply-demand balance, 2006-10F

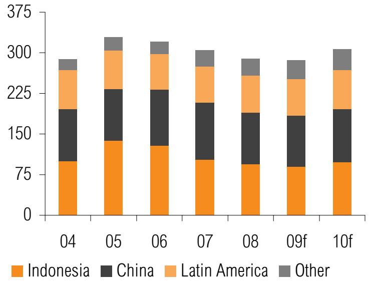
'000 tonnes	2006	2007	2008	2009F	2010F
World mine production	319	303	288	285	305
World refined production	**356**	**347**	**324**	**325**	**345**
Change, %	2.3%	-2.5%	-6.6%	0.3%	6.2%
US DNSC stockpile sales	9	8	4	0	0
World refined consumption	**363**	**356**	**338**	**310**	**340**
Change, %	**8.7%**	**-1.9%**	**-5.1%**	**-8.3%**	**9.7%**
Implied market balance	**2**	**-1**	**-10**	**15**	**5**
Change in reported stocks	-3	0	-3	15	3
Reported stocks	36	35	32	47	50
Stock: consumption ratio, weeks	**5.1**	**5.2**	**5.0**	**7.9**	**7.6**
LME cash price, US$/tonne	**8,755**	**14,526**	**18,487**	**13,535**	**15,000**
LME cash price, US$/lb	**3.97**	**6.59**	**8.39**	**6.14**	**6.80**
Change, %	19%	66%	27%	-27%	11%

Source: CRU, ITRI, WBMS, RBS estimates and forecasts

Scope for supply growth in 2010 but less thereafter

We have shaved our forecast of 2009 world tin mine production but have left that for refined output unchanged at 325,000t. This points to a marked tightening of the concentrate market. One factor has been a steep decline in production at Pitinga in Brazil following a change in ownership, although this has been offset by the ramping up of the mines of Metals X in Australia. More significant have been developments in Indonesia. Low national mine output in H1 09 was then compounded by a fresh police crackdown on illegal activity. Many small-scale mines and smelters were forced to close and although they have gradually been reopening in recent weeks, we estimate that Indonesian mine production will be down a further 4-5% in 2009. Refined output has held up better but largely because PT Timah has run down its concentrate/slag stocks. Elsewhere, Chinese refined production has recovered strongly following the big cutbacks of Q4 08 and Q1 09 but dependence on imported raw materials has increased.

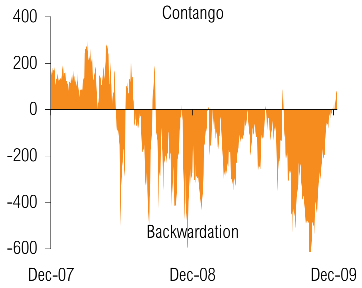
World tin mine output by major country/region, 2004-10F ('000t)



Source: CRU, WBMS, RBS forecasts

With world mine output in 2009 down perhaps 13% from its 2005 peak, there should be scope for a return to growth in 2010. But the tightness of raw material supply suggests refined tin production will barely keep pace, even with a pick-up in recycling activity. At the mine level, solid growth can be expected in both Latin America and Australia. **Pirquitas** in Argentina (2.5ktpa) is up and running, the Bolivian tin industry is now in expansion mode, Brazilian production could start to recover, and **Renison/Mt. Bischoff** in Australia should contribute more in 2010. Yet these two regions will together raise global output by only 2-3%; so much will hang on developments in the two dominant producer nations, China and especially unpredictable Indonesia. We expect both to reverse the price-induced losses of 2008-09 but it looks unlikely that either will return to the production levels even of 2007. In all, we forecast that world tin mine and refined output will rise by 6-7% at most in 2010.

Tin's persistent backwardation has dissipated (US$/t)



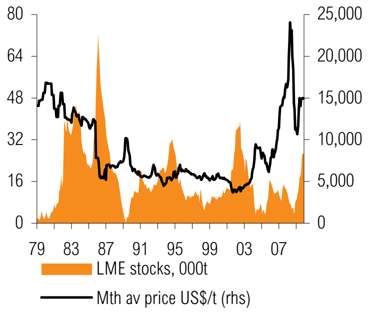
Source: LME

Not only are the risks to our forecasts on the downside, but also it is harder to see where material production growth will come from post-2010. There is still a dearth of new mine projects and the world remains dependent to an uncomfortable degree on Indonesia, where sustainability is increasingly in question.

Oppressive surplus over, supply constraints loom

We have raised our estimate of the tin surplus in 2009 to 15,000t but still believe the vast bulk of it occurred in the first half. The stabilising of demand has brought the market close to underlying balance in H2 09. That LME stocks have continued to rise to well over 25,000t may be largely explained by the earlier running down of PT Timah's metal stocks and the resurfacing of some of the unreported inventory that has built up in recent years. The market may even have moved into deficit in Q4 09 and now that the controversial backwardation has dissipated, there is less incentive to park tin on the LME. Although we forecast a small surplus in 2010, output could easily fall short of our expectations and the dearth of new mines may lead to growing market tightness from 2011.

LME tin stocks up sharply, but still not high by historical standards



Source: LME

That tin's price recovery still lags behind those of most base metals has more to do with its higher starting point relative to past lows and the fact that it is not a constituent of key commodity indices than with relative fundamentals. Tin's fundamentals have not been markedly worse than most in 2009, and we expect it to post a particularly strong cyclical recovery in demand in 2010. Trend demand growth is unlikely to return thereafter to the rate of 2003-06 but tin has latent supply constraints similar to other metals. Nevertheless, we now feel that tin may have to wait until late 2010 before it begins to catch up and the LME price establishes itself above US$15,000/t. But 2011-12 should see solid gains.

Gold

The gift that just keeps on giving….

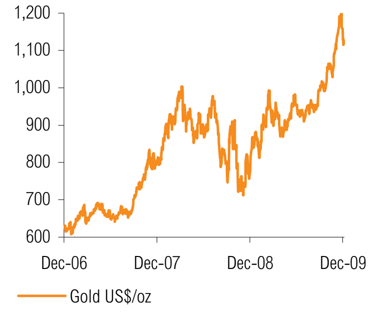
The Gospel of Matthew relates that when the Three Wise Men arrived, “they saw the young child with Mary his mother, fell down, and worshipped him; and opening their treasures presented him with **gold**, frankincense and myrrh”. These were viewed as the most valuable items in the ancient world. Gold is still valuable, and as we prepare to celebrate Christmas, gold has recently been trading at its highest ever level in nominal terms. We like to divide gold watchers into three groups. Gold atheists (non-believers); agnostics, and firm believers or gold disciples. Our plea to the gold atheists is that they should not consider investment in gold as a matter of belief, but a matter of inquiry.

Gold, in averaging 2009 at US$975/oz, will uniquely among the base and precious metals have achieved nine consecutive years in which the annual average price has been higher than that of the previous year. Gold is the gift that just keeps on giving. We have since January 2009 had a 2010 gold price forecast average of US$1,000/oz – a forecast we once again leave unchanged. Our stance, however, is that gold has hit our targets and we are, for now, soft-peddling with regards to chasing the price higher.

Gold posted a record high fix of **US$1,218.25** (and an intra-day high of US$1,226/oz) on 3 December 2009. The lead up to the peak was mainly driven by the shock and profoundly exciting announcement early in November, that the Reserve Bank of India had purchased 200 tonnes of gold, worth nearly US$7bn, from the IMF. The gold price has since eased back around US$100/oz from its record high, not only in USD terms but in most major currencies.

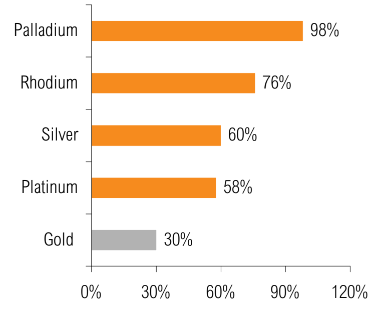
Gold’s slide from its highs was for the usual reasons of technical selling and a move to a risk-off trade as end year approaches. But without doubt the prime reason was the sudden return of US dollar strength following a rash of more positive economic signals regarding the US economy. **These periods of price weakness are not unusual and do not, in our opinion, herald a major reversal in the gold market’s fortunes**. We urge investors to focus on gold’s supply demand fundamentals. Mine supply is constrained; jewellery demand is well below record levels, inflation concerns lurk in the wings and the impact of potential timing mismatches with respect to quantitative easing remains.

Gold coming off record highs but what a fantastic run!



Source: LBMA, Thomson Reuters, RBS

Gold; still trying to catch up with the rest of the sector



Source: LBMA, LPPM, RBS

RBS world gold market supply demand balance 2005-12F – price to pause in 2010 before advancing once more

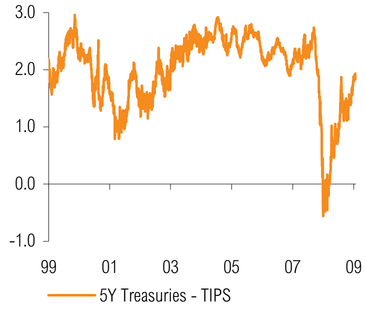
Tonnes	2005	2006	2007	2008	2009F	2010F	2011F	2012F
Mine production	2,550	2,485	2,478	2,414	2,502	2,550	2,560	2,500
Change, %	*2.2%*	*-2.5%*	*-0.3%*	*-2.6%*	3.6%	1.9%	0.4%	-2.3%
Net Official Sector sales	663	365	484	236	0	100	100	50
Old Gold Scrap	898	1,129	958	1,209	1,500	1,200	1100	1000
Producer hedging	-92	-410	-444	-351	-240	-70	-70	-50
Total Supply	**4,019**	**3,569**	**3,476**	**3,508**	**3,762**	**3,780**	**3,690**	**3,500**
Change, %		*-11.2%*	*-2.6%*	*0.9%*	7.2%	0.5%	-2.4%	-5.1%
Jewellery	2,712	2,288	2,404	2,191	1,770	2,000	2200	2500
Other	580	648	671	692	640	660	670	670
Bar hoarding	264	235	236	392	200	250	250	250
Consumption	**3,556**	**3,171**	**3,311**	**3,275**	**2,610**	**2,910**	**3,120**	**3,420**
Change, %	*3.8%*	*-10.8%*	*4.4%*	*-1.1%*	-20.3%	11.5%	7.2%	9.6%
ETF investment	208	257	250	318	575			
Implied market balance	**255**	**141**	**-85**	**-85**	**577**	**870**	**570**	**80**
London spot fix, US $/ounce	**444**	**604**	**695**	**872**	**975**	**1,000**	**1,075**	**1,200**

Source: GMFS, LBMA and RBS forecasts

Investors looking to gold for a variety of reasons

The economic and financial environment has been throwing up a series of reasons that have informed investor attitudes to gold in recent weeks and months. Most of them are well-rehearsed, but few have gone away and, while investors have already been taking financial insurance in the form of gold holdings, there is no reason to suppose that the coffers are full. The British Press recently noted that the BlackRock US$2bn **Gold & General Fund** was the best-performing investment fund in the industry over the past decade, with returns of 732% driven by its high correlation to the gold price. The gold price has risen 457% from US$220/oz in 1999 to its recent record of US$1,226/oz.

US five-year inflation expectations (5Y treasuries vs TIPS)



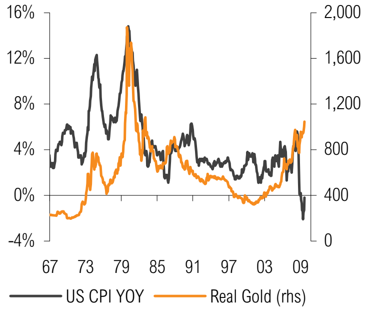
Source: Thomson Financial, RBS

The US dollar in the short term and inflationary fears for the medium term

The dollar has remained one of the key drivers of the gold price during Q4 09. The USD and consequently the gold price have been largely driven by appetite for risk. The USD remains the main funding currency, i.e., risk appetite increases, investors in search of higher yields sell USD and buy riskier currencies or assets, leading to USD weakness and consequently a higher gold price.

That said the relationship between gold and the VIX volatility index has remained relatively loose. VIX measures risk through equity market option volatility and is a good measure of sentiment. The fact though that it operates through equity options suggests that the time horizon in the eyes of investors using VIX as a hedge is probably shorter than those looking to gold as a long-term hedge against financial fragility and goes some way towards explaining gold's comparatively low correlation with VIX. Since mid-November, the correlation between gold and the VIX has been negative 25% and between the USD: EUR rate has been 67% and between gold and the G-6 weighted dollar, 62%.

US CPI yoy vs real gold price, high inflation has been positive for gold



Source: Bloomberg, RBS

Good economic figures; generally good for gold

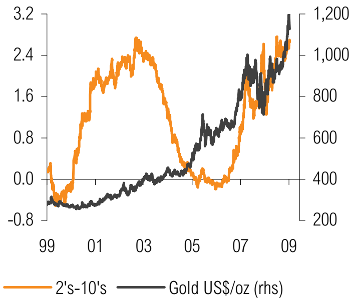
Quite apart from the boost to market confidence that good economic figures produce with respect to the prospects for renewed consumer spending, encouraging economic numbers, especially in the United States, have been tending to lead to periods of dollar weakness as investor confidence is boosted. In addition, the commodities sector has generally come in for independent support in these sets of circumstances and gold, as a result, has reaped a dual benefit. Furthermore, in the latter part of 2009, as market confidence has gradually increased with respect to the economic outlook, good economic numbers **have continued to raise concerns about the return of inflation**, especially following the massive expansion of governments' balance sheets.

…uncertainty over QE exit strategies

In addition to the inflationary implications of recent fiscal support, the markets have for some while been concerned about the degree of co-ordination with which various economic stimulus programmes are wound down and the knock-on effects on exchange rates and bond yields, particularly in the US. The Dubai World debacle in late November has given the markets a sharp reminder that the problems in the financial system have not fully been resolved and there is much debate about the chances of another large-scale banking default (or defaults).

While fiscal stimulus averted a catastrophe in late 2008 and 2009, it is argued, the prospect of further problems in the system means that the unwinding cannot start anytime soon and – worse – that if there are more bailouts to come, then it may not be possible to borrow enough money to shore up the banks in question.

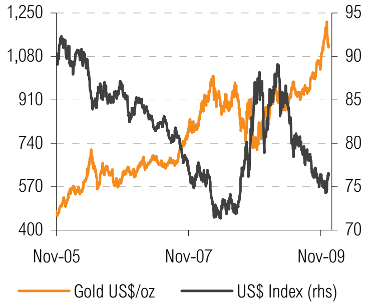
Gold and the US benchmark yield curve (2 years – 10 years)



Source: Thomson Financial, RBS

Has the US dollar had its day?

Gold and the trade weighted US$ – simple correlation = 90% post G20



Source: Thomson Financial, RBS

The debate about the dollar's position as the primary reserve currency has been with us for some time and it is certainly arguable that a diminution in the dollar's role on the international stage has already been discounted into its value. This has been compounded by Dr. Bernanke's statement in early December that the Federal Reserve will hold benchmark interest rates as low as possible for "an extended period" as it is not yet assured that the recovery can be self-sustaining or that it will substantially reduce the unemployment rate. The environment of low rates for longer helps to stimulate the use of the dollar as a funder for 'carry trades' and there is certainly anecdotal evidence to the effect that specualtors have been trading the dollar from the short side, partly for carry trade purposes.

Our house view published on 10 December – *Darwin's theory of currency evolution* – Alan Ruskin, is that the US dollar will pivot from a EUR/USD peak in the mid 1.55s before strengthening 13% by Q1 2011 to the mid 1.35s.

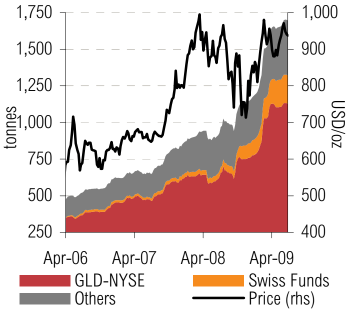
Investors see gold as insurance to some of the above issues…

The issues above generate uncertainly over the strength of the recovery and have potential to significantly increase volatility, this also works in gold's favour. One of gold's major attractions to fund managers in search of portfolio diversity is its low (or negative) correlation with the majority of mainstream assets, where gold as a portfolio component has a distinct smoothing effect on portfolio performance as well as expanding the efficient frontier.

… but gold ETF activity has been more muted since Q1 09 and there was some light liquidation in early December

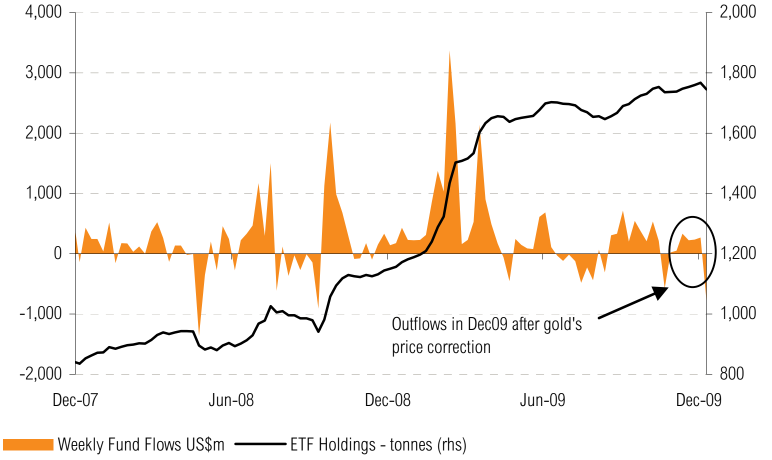
While the investment fraternity remains friendly towards gold, ETF purchases over much of Q4 09 have been steady, but light. Furthermore the volatility in the equity markets in early December has meant that some gold holders have become distressed sellers. In early December, combined holdings in the physically backed gold ETFs stood at a record 1,760t, before redemptions came from the SPDR ETF, which shed 15t as well as some modest redemptions from some of the smaller ETFs. Until that point, purchases in Q4 had amounted to 68t as buyers nibbled away steadily, with an average weekly inflows equivalent to US$113m. This, of course, is as nothing **by comparison with Q1 09, which saw purchases of over 440t with an average weekly net inflow of almost US$600m**, but those were exceptional circumstances in which ETF investment was as heavy as the sale of jewellery from traditional purchasing regions.

Gold ETF holdings; records, then sales in early December



Source: Gold funds, RBS

Net flows of funds to and from major gold ETFs, and spot gold price – daily dollar volumes have been modest on the whole in Q4



Source: Exchange traded fund sponsors, LBMA, RBS

ETFs absorb 23% of world mine production in 2009

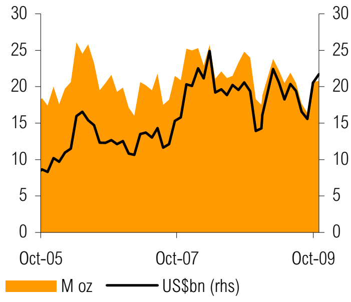
Between the start of 2009 and early December the gold ETFs expanded by 575t with a cumulative net inflow of US$17.4bn, with a total value of around US$70bn. We estimate 2009 mine production at 2,500t; therefore, ETF inflows are equivalent to 23% of mine production.

Warning: Volatility deters jewellery buyers; reduced investment may lead to further volatility – gold could be in for a roller-coaster ride

Although purchasing has slowed in terms of tonnage, the dollar flows remain relatively healthy overall. However, the speed at which the gold price fell in its early December correction towards US$1,100/oz is a salutary warning. Volatility picked up sharply towards the end of 2009, in line with a correction in the gold price; we expect this volatility to continue into early 2010. Despite the high gold price, the easing in volatility has aided the recovery in jewellery demand. But if price volatility continues to increase in early 2010, it may not only knock the wind out of the recovery in jewellery demand, but also lead to distressed sales from the investment community, increasing the possibility of price corrections.

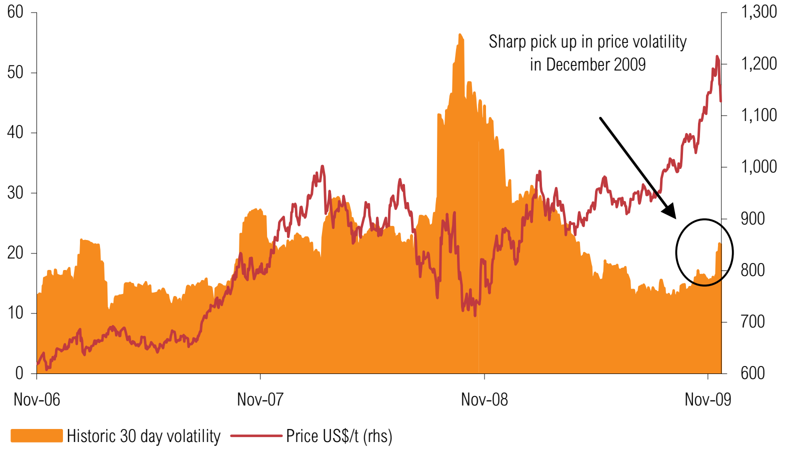
On balance, however, investors remain risk-averse and we continue to adhere to our oft-expressed view that the market will benefit from steady, but not aggressive, investor support.

LBMA clearing transfers; monthly average, moz and dollars



Source: LBMA, LPPM, RBS

Gold, 30 day historical volatility and price – Volatility can deter jewellery demand which prefers stability rather than price levels



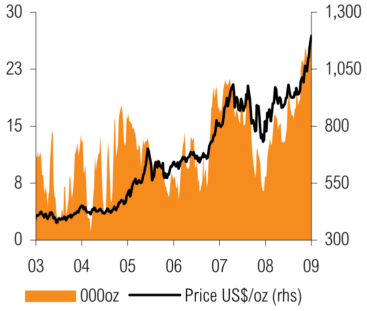
Source: CFTC, Thomson Reuters, RBS

Investors are friendly, but cautious; what of the speculators?

Speculators are if anything, more enthusiastic than longer-term investors, but of course they are equally liable to take a swift turn to the exit should prices continue to ease. On 4 December, the net speculative long position on COMEX stood at a record 958t, an increase of 102t since the start of Q4. This compares with ETF holdings of 1,745t. Out of the combined total of 2,700t of identifiable investor exposure, just 35% is through the net speculative long position on COMEX.

The easing of prices in December 2009 was accompanied by a fall in open interest, illustrating speculative liquidation and, given the speed of the moves, technically driven stop-loss selling. In the same way that the market needs a steady flow of investment interest in order to help take prices higher, the size of the speculative position underlines the fact that when sentiment changes, it can be seen as an 'overhang' that can help contribute to the sharpness of a downward reaction in price.

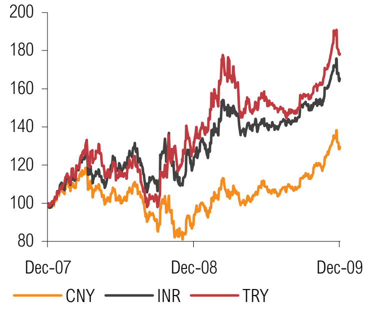
COMEX net speculative long position on COMEX



Source: CFTC RBS

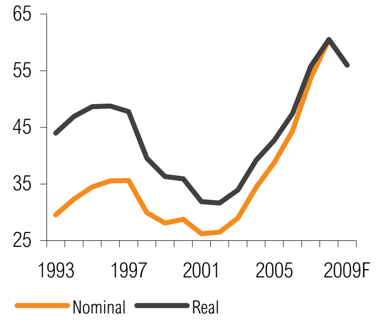
Physical demand; stabilising – or at least it was

Gold in consumer currencies; old resistance becomes support



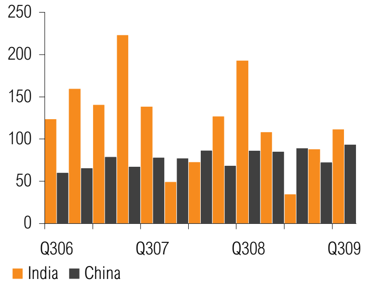
Source: LBMA, Thomson Reuters, RBS

Gross jewellery demand, US$bn, in real and nominal terms



Source: LBMA, LPPM, RBS

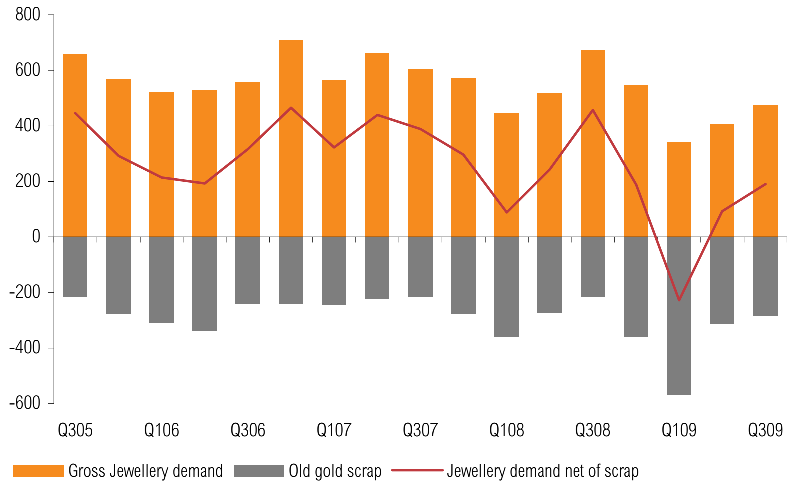
Quarterly jewellery demand India vs China (tonnes)



Source: WGC, RBS

The immense contraction in jewellery demand in Q1 09 came to a halt during Q2, and after a period of wound-licking the market started to return to life as we moved towards the traditional ‘gifting period’, characterised by the big Hindu festivals of *Dhanteras* and *Diwali*, the Indian wedding season and then, by the pre-Christmas fabrication activity, to be followed by the Chinese New Year – which in 2010 is late, falling on 14 February. **This year will be the Year of the Tiger, which is traditionally a year for overcoming setbacks and obstacles – which suggests a positive attitude towards gold.**

Gross jewellery demand, total gold scrap return and jewellery demand net of global scrap. Jewellery demand net of scrap is still improving (tonnes)



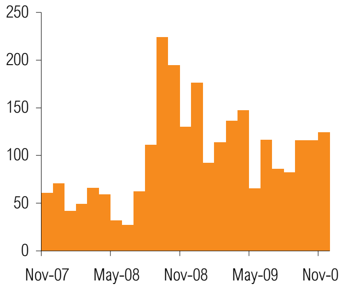
Source: WGC, RBS

Indian jewellers, who had been suffering a particularly torrid time in H1 09, generally reported that the festival season encountered good buying interest. Reports of jewellers starting to re-stock during and after the festival season, ahead of the wedding season confirms this. This is an encouraging development, as it reflects **domestic purchasers not only coming to terms with higher price levels, but buying in anticipation of further gains,** but this point should not be laboured as buyers are still cautious.

For much of the middle part of the year, the INR16,000/10g price level was seen in India as a resistance point, but this was cleared in early October and with it came a tentative belief that prices could move higher still, and this helped to underpin fresh purchases in the market. Sentiment was not wholly bullish, and there have been reasonably clear suggestions that any approach towards INR18, 000/10g might just be a step too far and that some holders would be prepared to sell gold at that level. **There is a suggestion that some new jewellery purchases are being funded by the return of old pieces**.

If the recent pick up in gold’s price volatility continues, it is likely to hamper fresh demand, at least in the short term. Price-sensitive markets dislike volatility and, although the Indian domestic price moved smartly to a premium to international prices when gold dropped by US$50/oz in one day at the start of December, that premium has subsequently been eroded. While the market price will have to settle before there is a meaningful increase in jewellery purchases in India, the emergence of a new investing class, is likely to be encouraging for local merchants

US Mint; US Eagle gold coin sales suspended again



Source: US Mint and RBS

Historically, the majority of gold purchasing in India has come from the agrarian community, which constitutes more than 60% of the national population. This is now being augmented by members of the new professional class, who are adding gold to their portfolios not only as the traditional means of hedging risk, but also, to preserve a degree of investment anonymity. It is, however, too soon to quantify the amount of metal that will be absorbed by this new constituency.

India is not the only country to have experienced a revival in gold demand as the year has worn on. **Other 'developing' nations are seeing volumes pick up**, not just as would-be purchasers become accustomed to high prices, but because the very weak demand in the first months of the year has led to a build-up of pent up demand. China, which has been vying with India for the position as the world's largest consumer (China is also now the world's largest mine producer) of gold has continued to register healthy gains. Consultancy GFMS estimates that in 2009 Chinese demand, at 432 tonnes, will for the first time overtake that of India at an estimated 422 tonnes.

Meanwhile, the picture is also patchy in the developed world, as the shifts in purchasing patterns earlier in the year (reduced weight, lower caratage in some places and also a partial shift to silver) may take time to reverse, although increased consumer confidence should help to bolster a recovery. The appetite for gold coins remains very strong with the US Mint once more having (in late November) to suspend sales of one-ounce Gold Eagles due to a lack of blanks.

Top official sector buyers and sellers – Jan09 – Dec09E

Country	YTD change
China*	454
India	200
Russia	112
Philippines	17
Sri Lanka	10
Mauritius	2
Taiwan	1
Netherlands	-9
Sweden	-14
ECB	-32
France	-73
IMF	-212

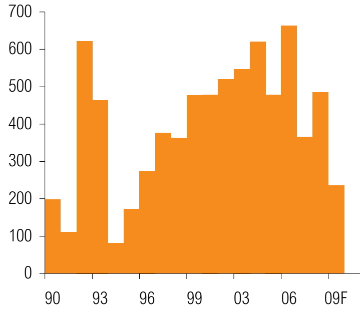
Source: WGC, RBS *China announced that it had been buying gold steadily since 2003 so 454 not all done in

The official sector – IMF goes off market

One of the most exciting news announcements on the gold market this year was the announcement from the IMF that 200 tonnes of its potential 403.3t sale had gone direct to the Reserve Bank of India.

The news broke during the annual Conference of the London Bullion Market Association, and it was clear that it had taken the vast majority of the market by surprise, even though there had been a general expectation that the IMF would place off market as much as possible of its potential 403.3t gold sale. The Fund has stated in the past, and iterated recently, that it is standing ready for an initial period to sell gold directly to central banks and other official holders that may be interested in such sales. The sale of 200t to the Reserve Bank of India (RBI) should, in principle, not have come as too much of a shock, but it did cause quite a stir. Probably, the most widespread reaction was that the counterparty was India and not China, which had been widely touted as the most likely purchaser of IMF metal. Since then the IMF has made two more small disposals.

Net central bank sales; forecast to fall to zero in 2009



Source: GFMS, RBS

Off-market IMF gold disposals

Timing	tonnage	To	proceeds, US$m
Second half of October	200	Reserve Bank of India	6,700
Early November	10	Sri Lanka	360
November 11	2	Mauritius	72

Source: WGC, RBS

The sale was part of the gold sales programme that is designed to help shore up the IMF's finances as well as enabling the IMF to increase concessional lending to 'the poorest nations'. In light of the recent IMF off-market transactions, and increasing interest from Asian central banks in increasing their gold holdings, we believe that it is likely that the vast majority of the IMF's 403.3t will be sold off market. However, if any of this material was to be sold into the market, these sales would be conducted within the Central Bank Gold Agreement 3 (CBGA 3).

If the IMF comes to the market, is that bad news? Not necessarily

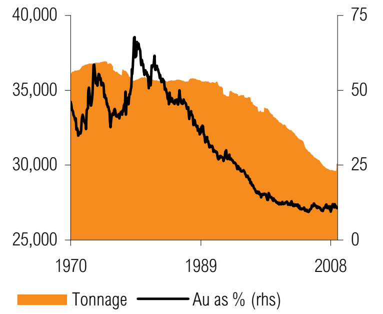
While the announcement of the IMF off-market sale to the RBI helped to propel gold higher in early November, there is every possibility that there will be a knee-jerk downward reaction in price if the IMF has to come to the open market, as this might imply that there was little remaining overt official sector interest in acquiring gold.

There may be an issue of timing here. Note that the Fund says "for an initial period" in terms of looking for official sector counterparties. While the Fund has not specified precisely over what period it is looking to sell, it cannot wait forever. Equally, there may be official sector bodies that, are looking to absorb gold, but are not prepared to pay very high prices. Both India and China have alluded to this in Q4 09. Although these comments are typical of central bankers' cautious natures, they highlight the point that **if the IMF comes to the market to sell some of its gold, it may be because of timing rather than an underlying disinterest from the official sector.**

Meanwhile, an official from the European Central Bank made one of the strongest statements on gold that we are likely to hear from a central banker, at the LBMA Conference stating **"we cannot be certain that gold holdings will continue to decline in coming years"**, reflecting the official sector's shifting view towards gold. Central bankers tend to hold to any of the four reasons for holding gold: a) economic security; b) as a contingency against unexpected needs; c) international confidence; and d) **risk management.** The latter is valued even more highly by central bankers than by other investors.

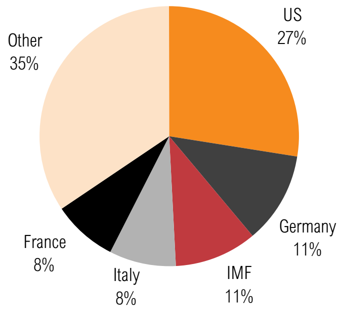
It is, therefore, perfectly possible that the official sector will become a net gold purchaser in the foreseeable future, but for the purposes of our supply-demand balance table, we have erred on the side of caution and assumed that some of the IMF gold may come into the open market over the next couple of years. Sales in the final year of CBGA 2 (2008-09) were just 155t (see chart) and we expect sales under the new CBGA 3 to be relatively limited.

Gold comprises less than 11% of total world FX reserves



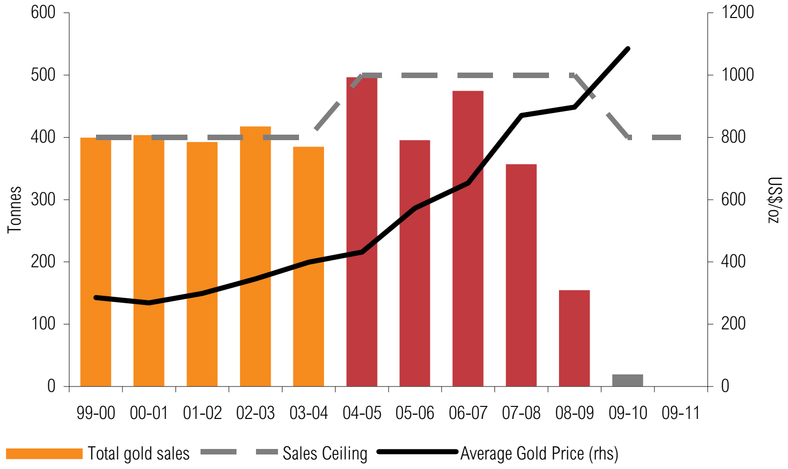
Source: IMF, Thomson Financial, RBS

Major central bank gold holdings, September 2009



Source: WGC, IMF, RBS

Annual gold sales under CBGA 1and 2. Sales in 2008-09 were just 155t, lowest in 10 years. We expect sales in CBGA 3 to be limited



Source: IMF, Thomson Reuters, RBS

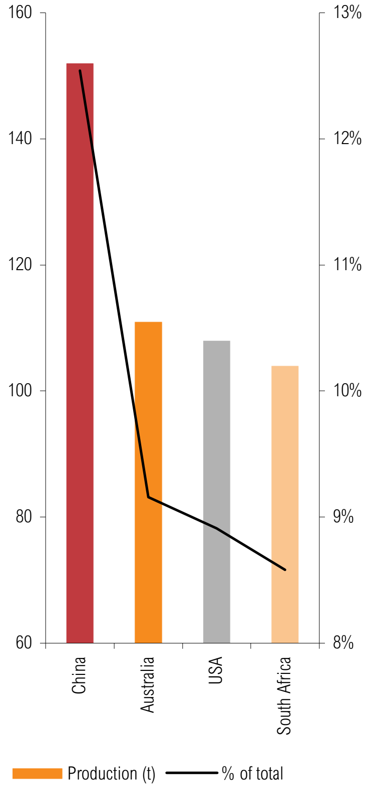
Mine supply; Barrick takes the spotlight…

… but leaves AngloGold Ashanti in the market's sights

We noted in our October Companion that Barrick had announced in early September that it would close its fixed-price gold forwards (which at that point stood at 93t) over the following 12 months. The company stated, on 1 December, that it has **now closed them all out**. This means that over June-December, Barrick effectively took 168t of gold out of the market. On an annualised basis, this equates to 403t – which is not only almost exactly the amount of IMF gold due for disposal, but also very close to the amount by which we are expecting gross jewellery demand to fall in 2009.

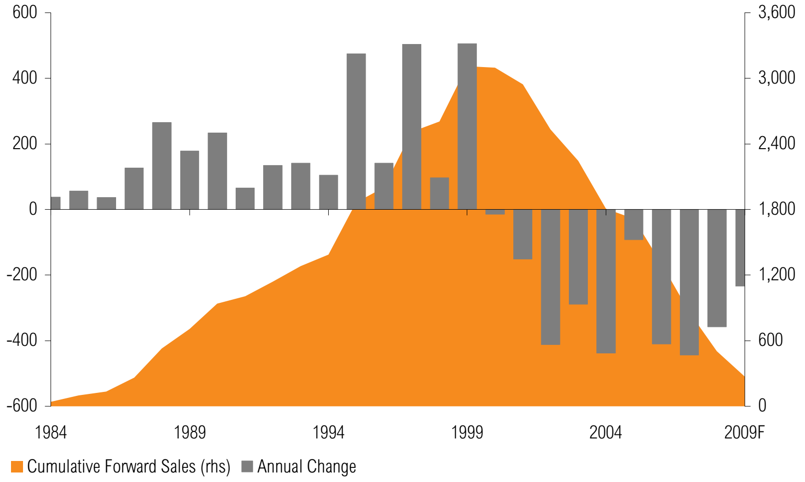
This leaves AngloGold Ashanti holding the lion's share of the outstanding global book, with a delta-adjusted total of about 120t. Whether shareholder pressure develops on AngloGold to reduce this book further remains to be seen. However, at current prices, the marked-to-market value of the book exceeds AngloGold's cash availabilty, and this may preclude any such hedge lifting.

Top 4 mine producers - H1 09 mine production and % of world total



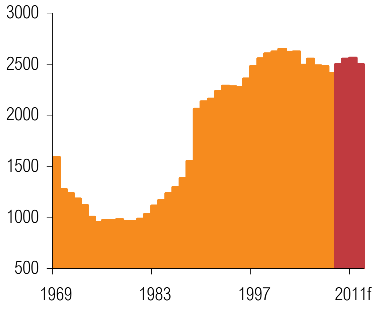
Source: GFMS, RBS

Global gold hedges stood at 3,064t in 2000; and at end-2009 they are likely to be just 250-260 tonnes



Source: GFMS, RBS

Gross gold mine production 1969-12F – supply response limited



Source: GFMS, RBS

If producer de-hedging is removed, gross mine supply is expected to increase by approximately 200t in 2009. More reductions in de-hedging next year (assuming that there are no large-scale buybacks) means that net mine supply in 2010 is likely to increase by another 200t, although the increase tails away sharply thereafter, and by 2012 we expect mine production to fall back to 2009 levels (see chart on the left).

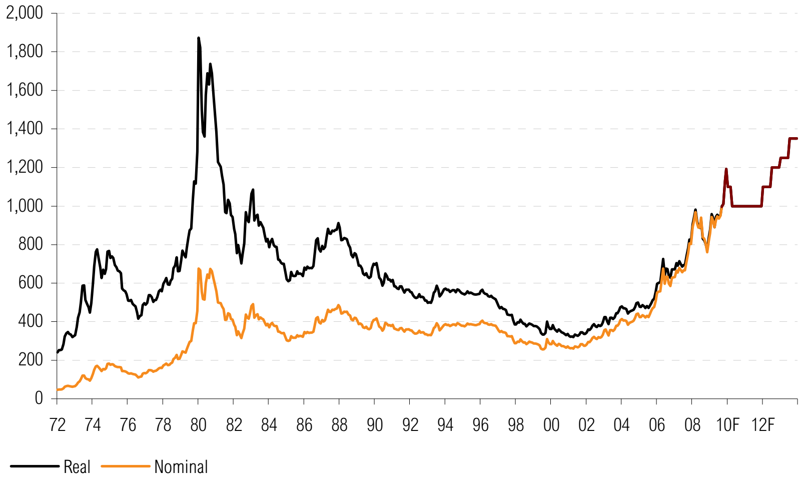
Among the larger mines contributing to the increase in supply next year is a very sizeable contribution from Newmont's **Boddington** in Australia as it ramps up to full production, while Barrick's **Cortez** in the US and Agnico Eagle's **Meadowbank** in Canada are also substantial operations. In Africa, Resolute's **Syama** in Mali will produce additional material, as will Orezone's **Essakane** in Burkina Faso.

Gold still one for the long haul

The price volatility of gold makes it a perfect trading counter. Be a serial “dater” – date gold, don’t marry it! Our overall faith in gold as a viable investment counter remains unshaken and the recent sharp correction in price offers those who thought they had missed out on the opportunity to invest in gold, yet another bite of the cherry.

We do, however, caution that a lot of perceived future financial risk is already discounted into the price, as evidenced by the dynamics of the Exchange Traded Funds over the course of this year and the record net speculative position on COMEX. The physical market is improving, but recent price volatility may hinder this recovery and it must be open to question as to whether gold can re-establish new records in ‘local’ currencies next year. Our forecast for gold to average US$1,000/oz in 2010 has remained unchanged in each of the Companion reviews that we have published this year.

Gold price in US dollars, real vs nominal since 1972 -2013F. Despite the rise, still plenty of upside potential in real terms



Source: LBMA and RBS forecasts

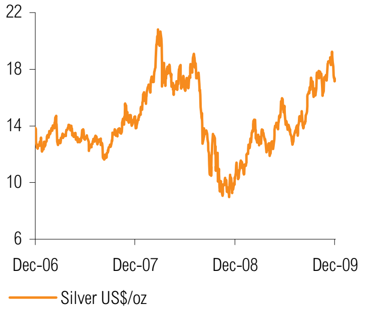
We view 2010-11 as a period of price plateau and consolidation while it builds a head of steam for fresh advances to an average US$1,200/oz in 2012F and US$1,300/oz in 2013F. We continue to believe that although occasional forays may occur below the US$1,000/oz marker, US$1,000/oz should be viewed as a price floor, rather than a price ceiling.

Silver

Not well placed to resist gold corrections

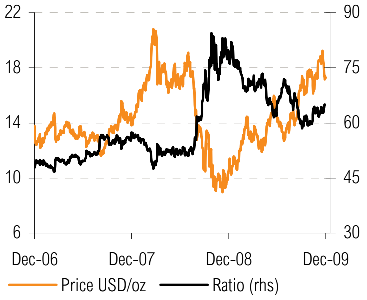
Silver's range in Q4 09 has been over US$3.50/oz or 20%. Price action has been characterised by sudden moves higher, followed by swift retreats as signs of strains emerged. Always alive to gold rallies, silver bounded in two leaps towards US$19.50/oz in early December, only to plunge by 12% in five trading days. Whilst ETF holdings have risen strongly in recent weeks, the speculative position on COMEX has been volatile, pointing to some 'short-termism'. Silver is in part an industrial metal, and it consistently generates surpluses before ETF investment. We forecast further fundamental surpluses in 2010-11, so silver might be particularly vulnerable to any sustained period of ETF redemptions. We expect the silver price to continue to follow gold, and given our view of gold, we forecast that silver will spend long spells well below US$17/oz in 2010-11. But, helped by a narrowing surplus, we forecast that the silver price will recover to above US$20/oz in 2012-13, eventually topping the high of March 2008.

Silver price –always vulnerable to sell-offs



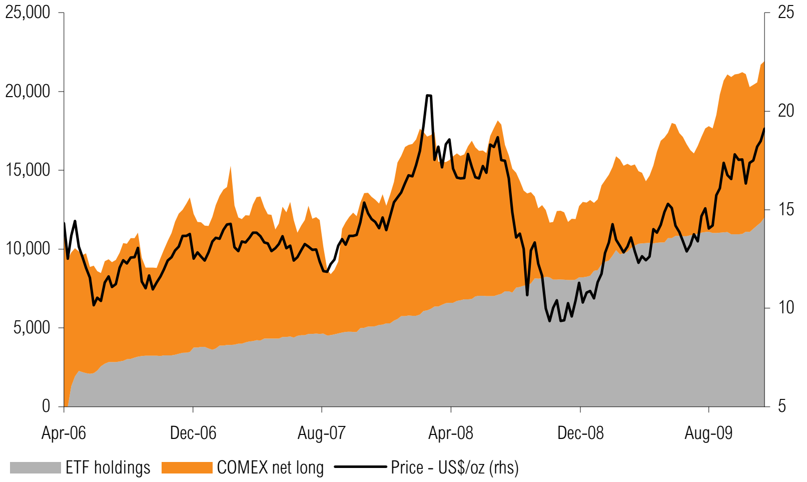
Source: LBMA

Silver and the gold:silver ratio – struggling to push through 60:1



Source: Thomson Reuters, RBS

Silver net speculative long position on COMEX and ETF holdings (t) – ETFs have remained stable, COMEX net long is much more price sensitive



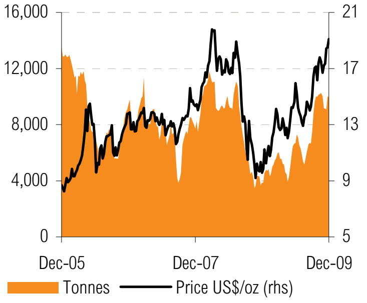
Source: ETF Securities, iShares, ZKB, CFTC, RBS

RBS world silver supply-demand balance, 2005-12F – ETF investment should absorb most of the 2009F surplus but we question if this level of investment will continue in the future?

Tonnes	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**
Mine production	20,026	19,945	20,660	21,179	21,600	22,000	22,500	22,500
Change, %	*3.7%*	*-0.4%*	*3.6%*	*2.5%*	*2.0%*	*1.9%*	*2.3%*	*0.0%*
Net government sales	2,100	2,432	1,316	961	700	600	500	350
Old silver scrap	5,786	5,847	5,658	5,493	5,300	5,000	4,800	4,600
Producer hedging	859	-211	-731	-336	-400	-150		
Total Supply	**28,771**	**28,013**	**26,903**	**27,297**	**27,200**	**27,450**	**27,800**	**27,450**
Industrial Fabrication	12,607	13,203	14,105	13,909	11,200	12,800	14,000	14,700
Photography	4,987	4,429	3,882	3,260	2,850	2,700	2,550	2,400
Jewellery, silverware and coins	8,762	8,313	8,149	8,725	9,150	8,750	8,825	9,200
Consumption	**26,356**	**25,945**	**26,136**	**25,894**	**23,200**	**24,250**	**25,375**	**26,300**
Change, %	*2.0%*	*-1.6%*	*0.7%*	*-0.9%*	*-10.4%*	*4.5%*	*4.6%*	*3.6%*
Implied market balance	**2,415**	**2,068**	**767**	**1,403**	**4,000**	**3,200**	**2,425**	**1,150**
ETF investment		3,768	1,529	2,945	3,800			
Residual market balance	**2,415**	**-1,700**	**-762**	**-1,542**	**200**	**3,200**	**2,425**	**1,150**
London spot fix, US $/oz	**7.31**	**11.55**	**13.38**	**14.99**	**14.65**	**17.00**	**17.50**	**20.00**

Source: GFMS, RBS forecasts

COMEX net speculative long silver position and the silver price



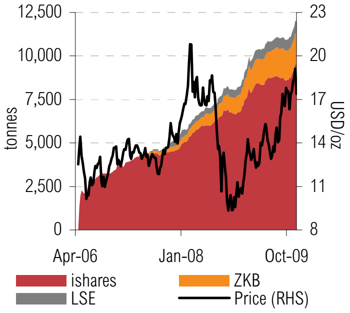
Source: CFTC, Bloomberg, RBS

ETF investment has picked up; holdings top 12,000t

While COMEX saw silver speculative positions contracting on both a net and gross basis during much of October and November, investors in ETFs took the opposite view. Though not strictly comparable, as the ETF holdings are physically backed and the speculative long position on COMEX is a 'paper' position, it is useful to highlight the differing attitudes among the broadly different market participants. Participants taking speculative positions on COMEX tend to have relatively short-term investment mandates and the net speculative long position tends to fluctuate with price movements. ETF investors, on the other hand, tend to take a longer-term view and history shows that despite the sharp decline in the silver price in H2 08, ETF holdings have continued to rise steadily. At over 12,000t, ETF holdings now equate to over six months of mine output.

In the four weeks to mid-November 2009, ETF holders and speculators took diametrically opposed views of the market, partly reflecting their different time horizons. ETF holdings increased by nearly 550t (5%) during the period; on an annualised basis this would be equivalent to removing as much as 7,000t of potential supply, or a third more than estimated world scrap return for 2009. Over the same period the net speculative long position on COMEX plunged by 1,185t, or 12%, but it then leapt by nearly 950t in just one week, demonstrating the relatively high volatility of speculative holdings. Note too that this latter sharp rise in the net long came ahead of the price spike towards US$19.50/oz.

Silver ETF holdings and the silver price



Source: ETF Securities, iShares, ZKB, RBS

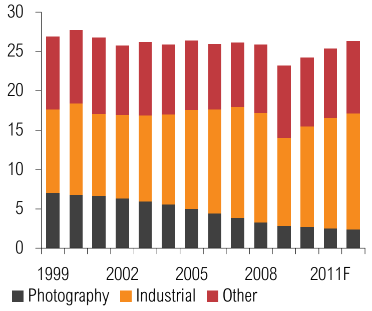
Industrial demand is starting to pick up

The surge in activity in the Exchange Trade Funds in November was combined not only with other over-the-counter investment activity, but also with what looks like a smart improvement in industrial demand for silver. There is evidence that, after a sustained period of de-stocking in 2009 and subsequently living from hand to mouth, industrial users (in the US at least) have accepted the higher silver price and started to rebuild inventory in anticipation of a tangible increase in industrial demand levels during 2010 and beyond.

We expect industrial fabrication demand to increase by 14% in 2010 with especially encouraging growth in the US. This improvement in US demand in particular may well feed through into further investment demand for silver. This will most likely come via the US ETF (the iShares fund), and has the potential to provide additional price support, given that the US households are the beating heart of silver investment.

Demand for silver in jewellery is rising in some other key markets, with India in particular showing improvements. This has been driven in part by the shifts in local attitudes, with local consumers reacting in some places to gold's high price and buying silver instead. There has also been a fundamental (and not unrelated) shift in attitudes in the country towards expecting further rises across the precious metal complex. Chinese demand also appears to be remaining robust in the face of high prices.

World silver fabrication demand by end use, 1999-2012F



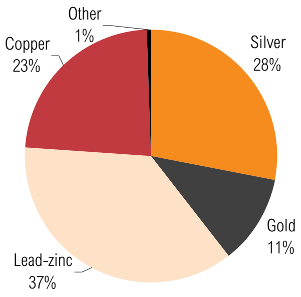
Source: GFMS, RBS forecasts

Scrap supply falling, mine production reviving

Secondary silver supplies have continued to decline and we have lowered our estimate of scrap return in 2009, although only by about 100t or 2% against the previous estimate. Declining photographic scrap continues to be the key driver here, both for 2009 and looking into the future.

We also expect a reduction in silverware and jewellery scrap supply in the coming months as weak holders are believed now to be largely out of the market, and also because of the expectation that prices will, if not increase further, at least remain high. Furthermore, if the world economy does continue to improve then the probability of distress selling is also greatly reduced.

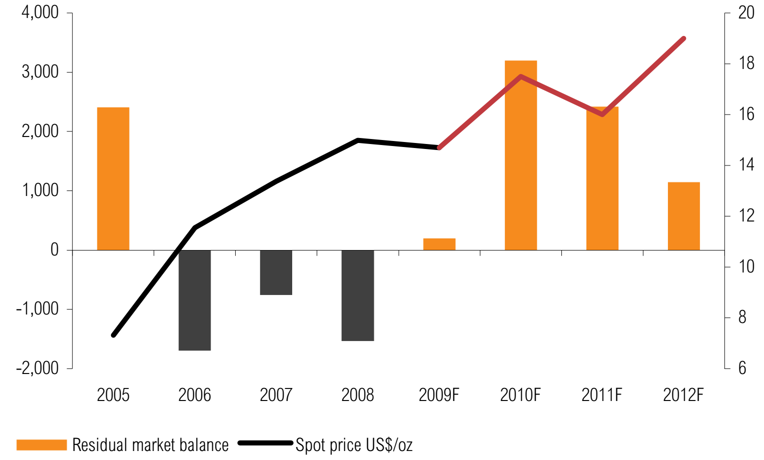
Silver mine supply by source, %



Source: GFMS, RBS

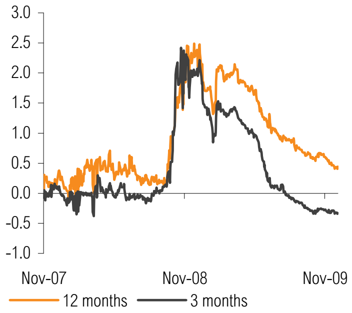
Silver mine supply remains on an upward curve, with our forecast profile more or less unchanged on balance from the figures produced in our October 2009 Companion. Rising output is being driven in particular from the gold sector rather than from the base metals, and primary silver production may if anything wane slightly over the next couple of years. Coeur d'Alene's gold mine, **Palmarejo**, came onstream earlier in 2009 and is expected to make a substantial contribution to growth in 2009 and 2010. However, the individual mines contributing the most to the change between 2009 and 2010 are the sulphide operation of **Peñasquito** (zinc; Gold Corp., Mexico), **Pirquitas** (silver; Silver Standard Resources, Argentina) and **Wolverine** (zinc; Yukon Zinc, Canada).

Silver market residual balance (t) and price (US$/oz) − hefty supply surplus forecast out to 2012, with investment demand needed to absorb the slack



Source: GFMS Ltd, RBS forecasts

Silver implied lease rates – liquidity remains ample



Source: Bloomberg, RBS

Fundamentals are improving, but prices may be peaking

The silver market, once ETF investment is taken into account, is expected to generate a small surplus in 2009. Although we expect a healthy improvement in demand in 2010 and 2011, driven by industrial offtake, above-ground inventories of silver are forecast to continue to increase. We believe that the silver price, as is the case in many of the other commodity markets, is already discounting a good part of the projected growth in demand in the foreseeable future. That said, silver's supply-demand fundamentals have had little impact on its price action in 2009. Instead, the silver price has been driven largely by gold's price movements and shifts in risk appetite. We believe these factors will remain the key drivers for silver in 2010, and if, as we expect, gold loses momentum, the silver price will ease, dropping well below US$17/oz for long spells in 2010 and 2011.

In the longer term, however, prices are expected to rebound in H2 2011 and beyond, in line with a recovery in the gold price and supported by narrowing market surplus. A return to above US$20/oz should be achievable by 2012. We expect the gold price to remain for the most part above US$1,000/oz for the foreseeable future, keeping silver well supported. But it should be said that the physical market is increasingly dependent on the ETFs to absorb persistent underlying surplus. **The silver ETFs represent more of a potential overhang than the gold ETFs, and the silver price would be more vulnerable to a sustained period of redemptions from the ETFs.**

Platinum and Palladium

Primed for prolonged price performance

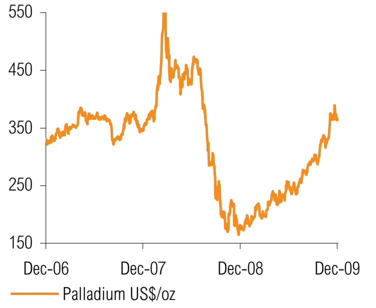
We expect the strong price recovery that the platinum group metals (PGMs) enjoyed in 2009 to continue in 2010, albeit at a more modest pace. We forecast that the PGMs will continue to outperform gold and silver on both a one-year and four-year view and palladium to outperform platinum over both of these periods.

The platinum market is expected to be broadly balanced in the coming years (prior to ETF investment). We expect platinum consumption to decline by 12% in 2009, largely due to a 25% contraction in autocatalyst consumption, but there are some positives to take away from 2009. Chinese demand for platinum jewellery has surged in 2009; reports from the field suggest that 2009 Chinese platinum jewellery demand may well be some 10t (310koz) higher than previously thought and may register the second-highest year on record. Although a significant proportion of this additional jewellery demand will have been as a result of the collapse in platinum's premium over gold, we believe that it also marks a shift in fashion in China and expect growth in Chinese platinum jewellery consumption to continue in the coming years.

The palladium market is expected to sustain a substantial underlying deficit (prior to ETF investment) for the foreseeable future. However, as has been the case in recent years, Russian shipments of palladium from inventory have the potential to significantly reduce forecast deficits, or push the market into surplus. The size of the Russian palladium stockpile remains the great mystery of the palladium market but the rundown of stocks cannot continue for ever. Russian palladium sales were substantially reduced for much of 2009, largely in response to poor industrial demand, and the figures available to date suggest that Russian exports are not running much in excess of local production rates. However, the first signs of an increase in Russian shipments were seen in October's trade numbers and it is still a possibility that palladium sales into the west have accelerated in the latter months of 2009 and may continue into 2010.

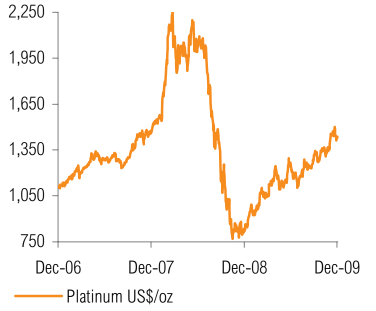
Platinum and palladium have been among the best performers in the commodity complex in 2009, gaining 60% and 100%, respectively, to mid-December. On a period average target price basis, we expect just 3% upside for platinum and 13% upside for palladium by Q4 10 but expect 45% and 80% upside, by H2 13. Palladium is our top commodity pick on both a 1 and 4 year view.

Palladium the best of the precious metals since end 2008, up 100%



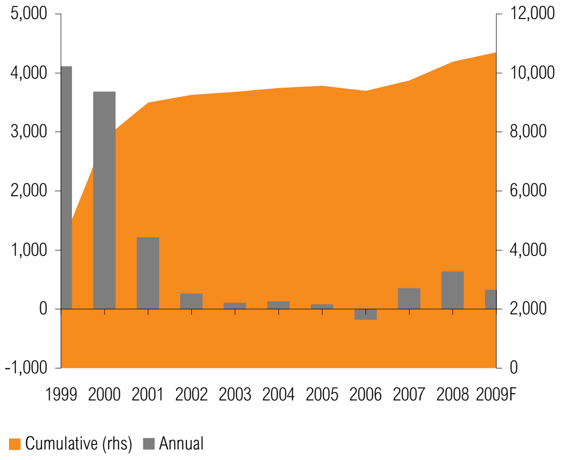
Source: LPPM

While platinum has added 60%. Both remain due for more gains



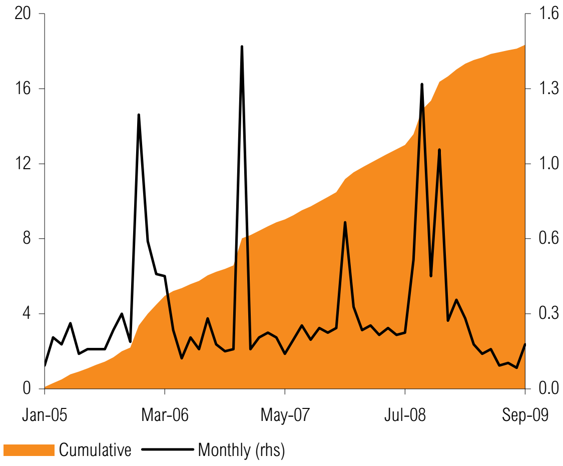
Source: LPPM

Annual and cumulative releases of palladium from global stockpiles ('000 oz) – rundown near 11moz



Source: GFMS, RBS

Monthly and cumulative Russian recorded exports to major trading partners (moz)



Source: Global Trade Atlas Navigator, RBS

RBS world platinum supply-demand balance, 2005-12F – we expect the platinum market to be broadly balanced in the coming years, but only prior to ETF investment

000oz	2005	2006	2007	2008	2009F	2010F	2011F	201F
South African mine production	5,054	5,447	5,074	4,671	4,444	4,750	5,100	5,200
Other mine production	1,570	1,577	1,509	1,480	1,380	1,430	1,500	1,580
Total mine production	**6,624**	**7,024**	**6,583**	**6,151**	**5,824**	**6,180**	**6,600**	**6,780**
Change, %	*3.3%*	*6.0%*	*-6.3%*	*-6.6%*	*-5.3%*	*6.1%*	*6.8%*	*2.7%*
Autocatalyst scrap	802	836	921	998	850	1,000	1,100	1,200
Jewellery scrap	340	350	543	910	300	330	300	330
Total supply	**7,766**	**8,210**	**8,047**	**8,059**	**6,974**	**7,510**	**8,000**	**8,310**
Change, %	*4.8%*	*5.7%*	*-2.0%*	*0.1%*	*-13.5%*	*7.7%*	*6.5%*	*3.9%*
Emission control catalysts	3,858	4,043	4,139	3,814	2,850	3,050	3,300	3,600
Jewellery	2,132	2,032	1,872	1,646	2,000	2,000	2,100	2,200
Other industrial use	1,821	1,776	1,950	2,334	2,000	2,250	2,500	2,500
Consumption	**7,811**	**7,851**	**7,961**	**7,794**	**6,850**	**7,300**	**7,900**	**8,300**
Change, %	*0.6%*	*0.5%*	*1.4%*	*-2.1%*	*-12.1%*	*6.6%*	*8.2%*	*5.1%*
Implied market balance	**-45**	**359**	**86**	**265**	**124**	**210**	**100**	**10**
ETF investment			-194	-102	-370			
Implied residual balance	**-45**	**359**	**-108**	**163**	**-246**	**210**	**100**	**10**
London spot fix, US $/oz	**897**	**1,143**	**1,303**	**1,572**	**1,205**	**1,450**	**1,650**	**1,800**

Source: GFMS, RBS forecasts

RBS world palladium supply-demand balance, 2005-2012F – we expect the palladium market to sustain fundamental deficits in the coming years, but shipments from Russian inventories may still act as a swing factor

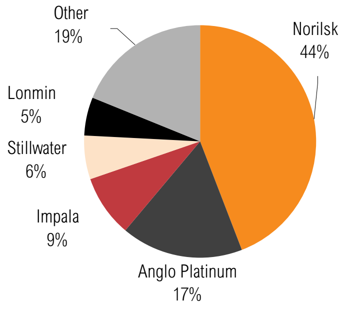
000oz	2005	2006	2007	2008	2009F	2010F	2011F	2012F
Russian mine production	3,133	3,164	3,049	2,712	2,660	2,660	2,660	2,660
Other mine production	3,822	4,191	4,032	3,669	3,450	3,600	4,000	4,100
Total mine production	**6,955**	**7,355**	**7,081**	**6,381**	**6,110**	**6,260**	**6,660**	**6,760**
Change, %	*4.9%*	*5.8%*	*-3.7%*	*-9.9%*	*-4.2%*	*2.5%*	*6.4%*	*1.5%*
Autocatalyst scrap	626	744	951	1,184	1,050	1,400	1,700	1,900
Jewellery scrap	103	234	184	195	130	120	125	135
Total supply	**7,684**	**8,333**	**8,216**	**7,760**	**7,290**	**7,780**	**8,485**	**8,795**
Change, %	*6.9%*	*8.4%*	*-1.4%*	*-5.6%*	*-6.1%*	*6.7%*	*9.1%*	*3.7%*
Emission control catalysts	3,924	4,330	4,719	4,416	3,700	4,400	5,000	5,400
Jewellery	1,363	1,281	1,283	1,301	1,300	1,300	1,350	1,400
Other industrial use	2,477	2,549	2,535	2,682	2,550	2,600	2,750	2,800
Consumption	**7,764**	**8,160**	**8,537**	**8,399**	**7,550**	**8,300**	**9,100**	**9,600**
Change, %	*6.2%*	*5.1%*	*4.6%*	*-1.6%*	*-10.1%*	*9.9%*	*9.6%*	*5.5%*
Implied market balance	**-80**	**173**	**-321**	**-639**	**-260**	**-520**	**-615**	**-805**
Stock releases	1858	1613	900	1300				
ETF investment			-280	-381	-490			
Implied residual balance	**1,778**	**1,786**	**299**	**280**	**-750**	**-520**	**-615**	**-805**
London spot fix, US $/oz	**201**	**320**	**355**	**351**	**265**	**400**	**450**	**550**

Source: GFMS, RBS forecasts

South African production is likely to remain constrained

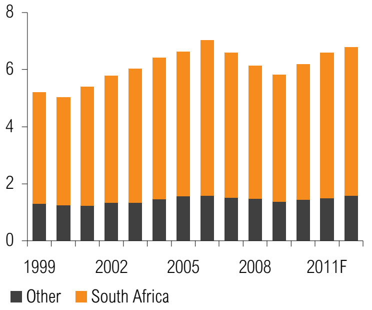
The majority of South African platinum producers are still struggling under difficult financial conditions despite the fact that the majority of prices for their products and by-products have made substantial gains over the course of 2009. As a result of the general improvement, Stuart Murray, CEO of **Aquarius Platinum**, announced in November that **conditions now permitted plans for the re-opening of the Everest mine in South Africa.** The mine had been suspended as a result of geotechnical problems, but Murray pointed out that re-opening the operation also called for a healthy prognosis for metals prices in

2008 top 5 palladium producers – over 80% of total



Source: GFMS, RBS

Platinum mine production (moz) – South Africa is the swing producer



Source: GFMS, RBS forecasts

order to generate an acceptable level of return on the investment that is being put in to improve the mine's infrastructure. Everest is scheduled to re-open in September 2010 and we would expect it to work up towards 110koz of annual platinum production thereafter.

At first glance, another bright point was **Implats**' announcement that its quarterly refined platinum production rose by 6% yoy or 23koz in the September quarter, but the devil is in the detail here. Implats suffered production losses during the mid-part of the year as a result of accidents and strike action at the Rustenburg mine. The positive results in terms of the refined metal outturn reflects increased production in Zimbabwe and a reduction of the in-process pipeline. Implats' overall production level in 2009 is likely to be down by approximately 100koz. Implats' total refined platinum production in fiscal 2009 (i.e., to end-June) amounted to 1.7moz, equivalent to ~32% of world primary refined platinum production and ranking second in the world. Palladium production was 1moz.

The world's largest platinum producer, **Anglo Platinum**, is yet to reinstate its dividend (suspended at the end of 2008) and continues to build debt. Anglo had stated that it was "managing its mine output" and maintaining a production target of 2.4moz for 2009, while running down pipeline and refined inventories, if necessary, to meet demand. Anglo's latest quarterly figures show that it ran off about 13koz from its pipeline, partially making up a qoq shortfall of 23koz of platinum as a result of the suspension of three high-cost shafts (Brakspruit, Siphumele and Boschfontein; annualised platinum production 140koz) in Q2/Q3 09, plus gaining fewer ounces from "pooling-and-sharing" agreements.

These figures may be small in the greater scheme of things, with total 2009 supply forecast at 7.0moz, but given that the market is forecast to be finely balanced in 2009 and 2010, these small shifts can be important at the margin. There is no sign as yet of any reinstatement of those three high-cost shafts. The company has said that this production will be replaced by lower cost material, while it continues to address cost considerations through labour reduction and improved energy efficiency.

Anglo Platinum signed wage agreements with the miners' unions in mid-October, with wage rises ranging between 9% and 10.5% in the first year and 7.5-8% in the second year, or CPI +2%, whichever is the greater. South African CPI was running at 5.9% in October 2009. The Implats agreement was reached in early September, following strike action (about 20koz of platinum lost).

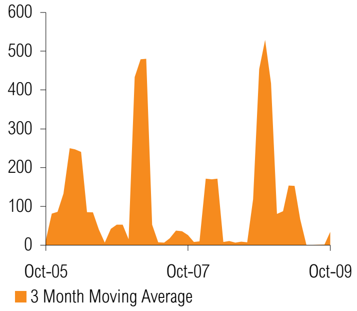
Lonmin, meanwhile, reported a financial loss in the financial year ended 30 September, although the company's bullish view of the market is underpinning its expansion plans, 20% or roughly 120oz of platinum per annum by 2013.

More Eskom tariff hikes to come

While the latest wage agreements in the sector range up to 10% and producers continue to battle to contain costs, there is another cost problem looming on the horizon. Following a tariff hike of 31% that was implemented in July 2009, the South African state power utility **Eskom has proposed an additional 35% tariff hike for each of the next three years**. This is a revision from the original proposal of 45%. A decision from the National Energy Regulator is due by 24 February 2010 and the first public hearings take place in early January. Platinum production was adversely affected by Eskom's imposition of a short-lived force majeure at the start of 2008, causing a spike in the platinum price. It is too early yet to say with any accuracy whether PGM production will come under threat, but any sizeable increase will threaten margins once again and may well result in continued deferment of some expansion plans.

In North America, **Stillwater Mining Company** (a 55% subsidiary of **Norilsk**) reported improved earnings for the September quarter. The company restructured its operations in late 2008 in response to poor market conditions, and reports that the ensuing improvement in productivity, allied to higher PGM prices, was enough to offset the impact of the loss of the supply contract with General Motors, which had contained ”favourable” floor prices.

Recorded Swiss palladium imports from Russia (’000oz)



Source: Global Trade Atlas Navigator, RBS

Russian palladium exports are on the increase once more, but the metal is not all, necessarily, going into inventory …

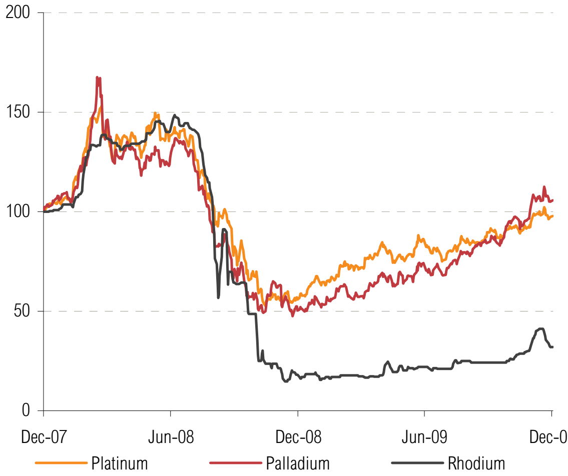
Historical analysis of the palladium market has revolved around the levels of Norilsk’s domestic production levels and the amount of palladium that sits in Russian state inventory. Norilsk produces not only production figures, but also guidelines for its expected output. The latest numbers project total 2009 palladium production of 2.86moz, compared with 2.82moz in 2008, with platinum production pared back from 655koz to 628koz.

Meanwhile, the focus of the market tends to be concentrated on the possibility of more sales from Russia’s state palladium inventory. For a full 20 years, market observers have been heard to opine that Russian palladium inventories are on the verge of exhaustion, but the metal has kept on coming. This year, the pattern of supply has been slightly different, in that once the August-February surge was over, sales into Switzerland, until recently the *de facto* terminal market for platinum and palladium, slipped very substantially. In May-September inclusive they averaged just below 1,000oz/month.

… but changes in the trading market may cloud the issue

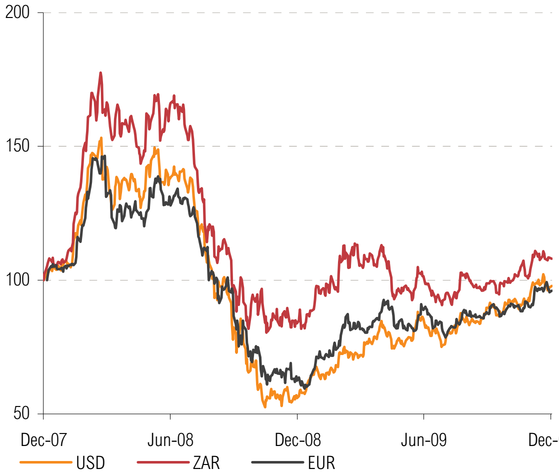
Since then exports have started to increase again, with a sharp jump to just over 100koz to Switzerland in October and also of almost 33koz to the UK in August (the latest available figures). The latter may be for a combination of reasons. Palladium market clearing is set to move to London from Zurich in February 2010 – this is in fact a delay from Q4 09, as one of the major clearers in Switzerland asked for more time to make all the necessary arrangements. Imports of Russian palladium into the UK in the latter part of 2009 and the first months of 2010 may therefore at least partially reflect the movement of material into London vaults rather than into industrial usage or into Swiss vaults. On this basis, it is certainly possible that the Russian government is again shipping from inventory, although at the moment **it does not look as if estimated shipments from Russian inventories of over 1moz in 2008 will be reached in 2009.**

Platinum, palladium and rhodium USD prices (December 2007 = 100)



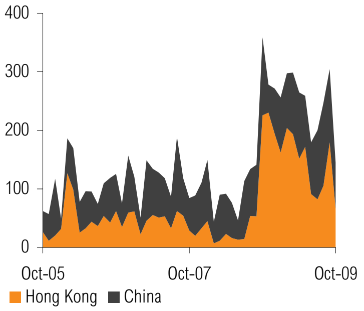
Source: Bloomberg, RBS

Platinum in USD, EUR and ZAR – currency fluctuations have had a significant impact on producer prices



Source: Bloomberg, RBS

China + Hong Kong's platinum imports ('000oz)



Source: Global Trade Atlas Navigator, RBS

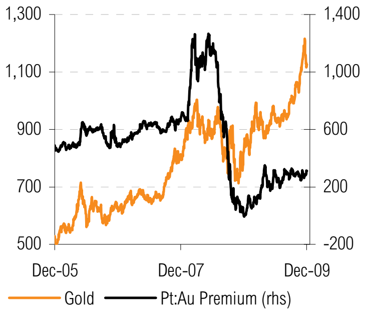
Meanwhile Russian palladium is still being exported into other major trading partners, notably Greater China and the US. China and Hong Kong have been persistently strong importers of both platinum and palladium over 2009, while anecdotal evidence of resurgence in demand in the US is well supported by international trade figures.

Demand – the summer slowdown in the US auto sector was followed by a remarkable bounce; Europe and Japan are still distorted slightly by incentives but the markets are surprising to the upside.

The chart to the left showing Chinese platinum imports indicates how strong Chinese demand for platinum has been in 2009, driven by both the remarkably robust performance from the jewellery industry and the buoyant state of the Chinese automotive sector.

Jewellery has enjoyed a healthy response to the fall in platinum prices during 2008 and it is looking as if Chinese platinum jewellery demand this year may approach 1.6moz, which would be the second-highest level on record. This improvement has been fuelled in part by the contraction in platinum's price premium over gold and manufacturers have reported that consumers have been reverting to platinum from white gold, to which they had switched when the price differential between the two metals was soaring.

The gold price and the platinum – gold premium (US$/oz)



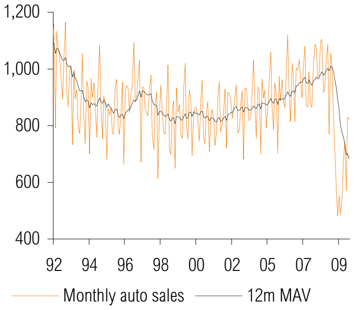
Source: Bloomberg, RBS

Whether this very rapid rate of growth can be sustained is, perhaps, open to doubt. Demand started to soften in Q4 09 in response to rising platinum prices. Manufacturers' purchases have also slowed as they have been building a cushion of inventory. The outlook is positive, however, with an increase in manufacturing capacity, bolstered also by the fact that Chinese consumer spending has been growing at a rate of 15%, with jewellery also supported by an increasing propensity for luxury items, stimulated in part by the feel-good factor stemming from higher asset prices.

Palladium jewellery should also, in theory, be benefiting from its wide discount to platinum, but despite a strong marketing campaign it is still finding itself facing a stiff uphill task against platinum. There are certainly pockets of demand for the metal and there is plenty of scope for improvement, but for the time being the majority of the market for palladium in China is concentrated in the automotive sector, which absorbs more than 50% of domestic palladium demand.

Jewellery demand in the rest of the world has been steady and the focus of the market is very much concentrated on China. The increase in platinum jewellery demand in 2009 has been almost entirely as a result of growth in China. But net demand in Japan continues to improve as a result of a sharp contraction in the return of jewellery scrap, which dominated the local market in 2008.

US monthly light vehicle sales ('000 units)

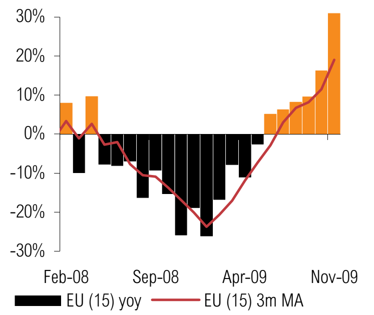


Source: Bloomberg, RBS

The auto sector – let the good times roll – or not yet?

The US auto sector has produced a comparatively solid performance in the latter months of 2009, confounding the sceptics who believed that there would be a further contraction in sales once the cash-for-clunkers programme was over (i.e., in September). Sales of light vehicles in September-November did of course contract sharply from the August surge and remain very low on a historic basis (see the chart to the left). Recent US economic figures support our view that the economic recovery in the US should be sustained into 2010, with US GDP growth forecast at 3.5% followed by further robust growth of 4.4% in 2011. In this scenario, we would expect the US auto industry to stabilise in 2010 and stage a significant recovery in 2011.

Monthly EU 15 passenger car registrations, % chg yoy



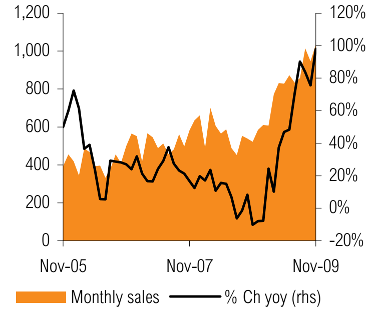
Source: ACEA, RBS

US trade figures do suggest that US manufacturers have not only stopped destocking, but may be starting to rebuild inventory. The US auto industry uses predominantly palladium for its emission control catalysts, due to the very low penetration of diesel in the sector (<5%). In 2008, overall imports of palladium (i.e., not just that destined for the auto industry) amounted to 2.2moz. In the first eight months of 2009, the US was a small net exporter of metal (although this is distorted by large shipments of metal to Switzerland in January), but imports increased sharply in August and even more so in September to just over 140koz.

Palladium has brighter prospects than platinum in the auto sector – but Europe is sending warning signals for the industry as a whole

While the US industry may be gradually stabilising, the European and Japanese markets are posing questions. The figures for recent sales are healthy, but must not be taken at face value as part of the European market is still being sustained by scrappage programmes, while the Japanese market is still receiving government stimulus. European car sales were up 29.2% yoy in November, but the industry is extremely cautious and warning that sales could well fall sharply in 2010, possibly by as much as 10%.

Chinese passenger car sales ('000 units)



Source: Bloomberg, RBS

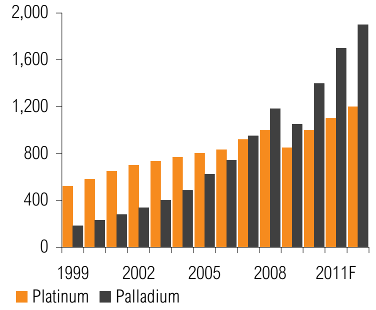
The German scrappage scheme has closed already, while the French programme finishes at the end of 2009. UK sales may also be hit in 2010 by the return of VAT to its 'normal' rate of 17.5% after a reduction to 15% in 2009. A better overall European performance is expected post 2010, with a tangible recovery developing in 2011. **Europe, with its 50% diesel market share, absorbs 47% of the world's consumption of platinum in autocatalysts, but only 31% of palladium demand.** This is changing, however, as developments in fuel technology are allowing palladium to make inroads into platinum's domination of the diesel sector and in parts of Europe, palladium is now commanding over 30% of the diesel sector's PGM usage.

The Chinese auto market is also still extremely strong, with Jan-Nov passenger car sales up by 50% yoy, but here too it is benefiting from government stimulus. Sales are being aided in particular by cuts in sales taxes for small cars. Recent concerns about the market perhaps moving into over-capacity now appear to have been allayed.

Automotive scrap recovery down in 2009, but to recover smartly in 2010

We described in the October 2009 Companion how palladium scrap supply is set to balloon in the medium term as there will be a massive increase in the number of cars reaching the end of their lives that are fitted with palladium-bearing emission control catalysts. This analysis has not changed; although the numbers have been adjusted very slightly, we still believe that by 2012 there could be as much as 2moz of secondary palladium supply coming into the market from this sector, or over 20% of total supplies. This is substantially higher than our projection for platinum, which stands at 1.2moz or 15% of total supplies.

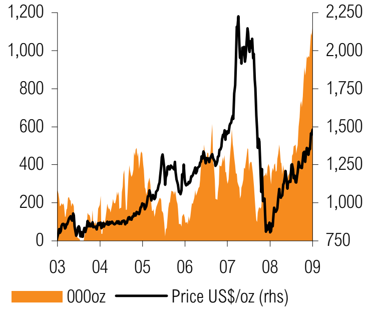
Platinum and palladium supply from autocatalyst scrap (000oz)



Source: GFMS, RBS forecasts

In the shorter term, however, there has been a drop in scrap supply from emission control catalysts in 2009. This partly reflects the sharp reduction in the purchase of new cars, and by extension, in part at least, the return of old vehicles, prior to the scrappage incentives. This was exacerbated by the fact that dismantling yards did not then return metal to the market as they were awaiting higher prices. The scrappage systems have now been lubricating the supply chain, as have higher prices, and secondary supply is now flowing once more.

Platinum net speculative long position on NYMEX



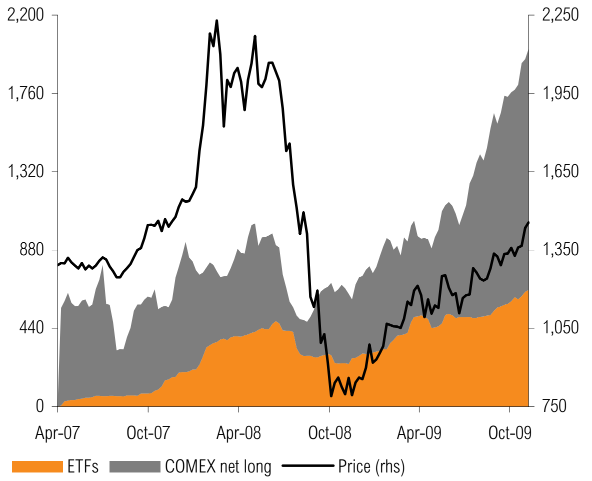
Source: CFTC, RBS

Investors still enthusiastic, but is this a potential overhang?

Investors and speculators have been enthused by the prospect of increased physical demand for metals in 2010 and have continued to increase their exposure to the platinum group metals. There are two liquid investment vehicles available for gaining exposure to the precious metals that can be easily monitored, giving an indication of investor interest in the PGMs: the physically backed ETFs and the net speculative long position in NYMEX. The perception of these two vehicles are quite different. ETF investors tend to take a longer-term view and tend to be less vulnerable to near-term selling as a result of profit-taking. 'Speculative' positions in the futures market, on the other hand, tend to be more volatile and are often subject to sharp profit-taking sell-offs that can accentuate price corrections.

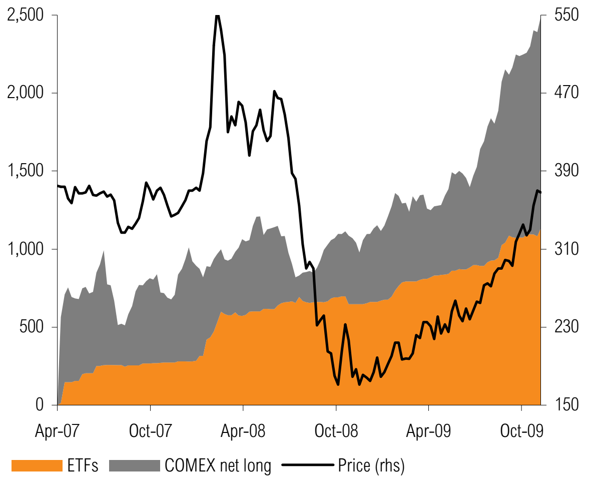
In early December, Platinum ETF holdings stood at a record 664koz and the net speculative long position on NYMEX also stood at a record 1,354koz. This brings combined (easily identifiable) investor holdings to over 2moz and is equivalent to about 30% of estimated 2009 platinum consumption. Nearly 70% of this investor exposure is through net speculative long positions on NYMEX.

Platinum ETF holdings, net speculative position on NYMEX ('000oz) and price – net long accounts for 67%



Source: ETF Securities, ZKB, RBS

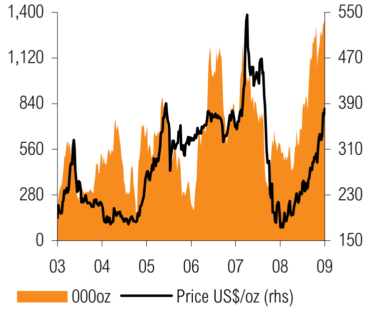
Palladium ETF holdings, net speculative position on NYMEX ('000oz) and price – net long accounts for 58%



Source: ETF Securities, ZKB RBS

Palladium ETF holdings and net speculative long also stood at a records in early December of 1.2moz and 1.6moz, respectively, a combined exposure of 2.8moz, 37% of estimated 2009 palladium consumption. However, investor exposure to palladium is more evenly spilt, with 58% on NYMEX and 42% through the ETFs

Palladium net speculative long position on NYMEX



Source: CFTC, RBS

We believe the metal held in the ETFs is likely to be in relatively 'safe hands' and do not expect a mass exodus from the ETFs to cause a material price correction in 2010, but the large net speculative long positions on NYMEX do represent a near-term threat. Whilst we do not expect the unwinding of speculative positions to cause a price correction on their own, if there were to be a near-term correction in precious metal prices, large-scale liquidation of speculative long positions would almost certainly accentuate any price correction. In this scenario, platinum would be more exposed than palladium.

That said, the longer-term fundamentals for the PGMs remain highly supportive, particularly for palladium. We also expect physical investment demand (via the ETFs) to remain robust in the coming years. We would therefore view any near-term sell-offs in platinum and especially palladium as a healthy correction in a long-term uptrend, and an excellent buying opportunity.

Iron Ore

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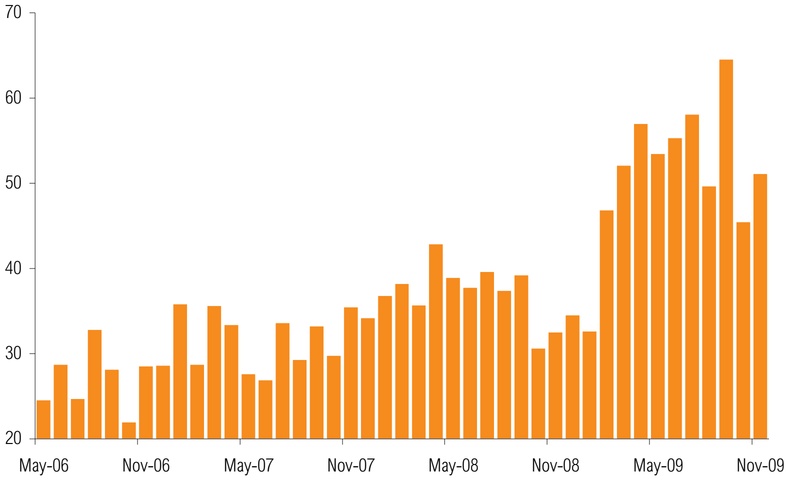
Excess steel production – excess iron ore demand

At the start of 2009, China's official steel production target for the year was 425-475Mt depending whether or not you took into account forecast stock drawdown or the estimated level of exports. China is now looking like it will end up producing 560-575Mt, roughly 100Mt or 25% more than early estimates. Installed Chinese steel capacity has risen from about 600Mtpa to in excess of 700Mtpa over 2009, leaving the iron ore market stretched to meet 2010 requirements. We believe that Chinese domestic iron ore production will rise to meet some of the demand but pressure on seaborne supply will occur in line with a broader improvement in steel production. **We forecast iron ore contract prices will rise by 20% in 2010** (up from up our previous forecast of +10%).

Upgrading 2010 contract price rise forecasts from +10% to +20%

Chinese iron ore imports up 37% YTD and the country's looking set to import about 620Mt of iron ore in 2009

Monthly Chinese iron ore imports (Mt) – Iron ore imports surge as Chinese steel production rises to record levels



Source: China general administration of customs, RBS

CISA unlikely to have an easy time at the negotiating table in 2010

It appears from recent press comments by China Iron and Steel Association (CISA) members that a price rise is an accepted outcome next year. However, given the recent trading relativities of Australian, Brazilian and Indian iron ore, we believe that the Australian iron ore producers will once again be pushing for a freight premium. This is unlikely to sit well with CISA, which is still trying to get a single price for Chinese imports, irrespective of the loading point.

Steel output still improving. In October, global steel capacity utilisation was 76%, 17.8 percentage points higher than December 2008

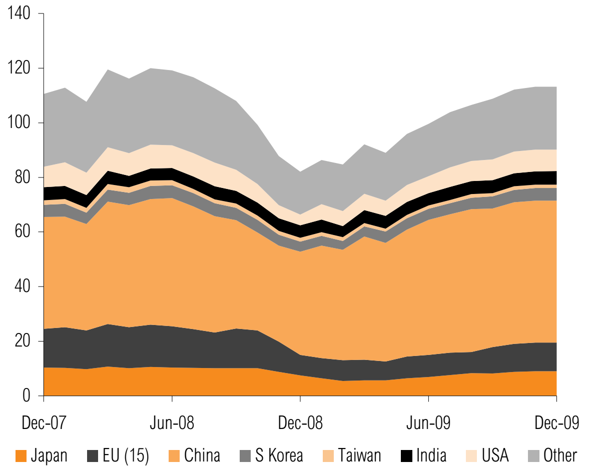
To feed the domestic steel industry, China will also consume over 800Mt of domestic iron ore in 2009

Steel production turns the corner and leads iron ore north

On the back of higher spot prices and an improvement in steel production, we have upgraded our iron ore price forecasts for next year from plus 10% yoy to plus 20% yoy. We believe that this year's negotiations have the potential to be more protracted than in 2009. Asian steel producers seem to be resigned to a price increase. Europeans want a decrease. All are likely to argue on the pricing structure and period, as well as the significance of BHP Billiton and Rio Tinto forming a production joint venture in the Pilbara. Based on recent iron price differentials into China, it is also possible that we may see the Australian producers ask for freight premium once again.

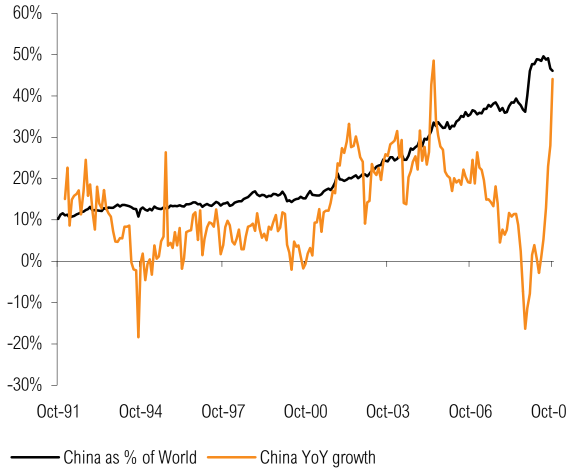
Iron ore trade and steel production is dominated by China. However, with the focus on China, it is easy to overlook traditional buyers. It is, therefore, worth noting that Japanese iron ore imports reached the highest level for 12 months in October. October imports were 11.2 Mt, marking the seventh consecutive month-on-month increase in Japanese imports since the March 2009 low of 5.9Mt and now at monthly levels consistent with imports over the last three years. The year-to-date imports are lower, 83.5 Mt compared with 118.6 Mt over the same period last year, but the demand for iron in Japan and other Asian countries does appear to have turned a corner.

Global crude steel production (Mt)



Source: IISI

China's share of global steel production and production growth

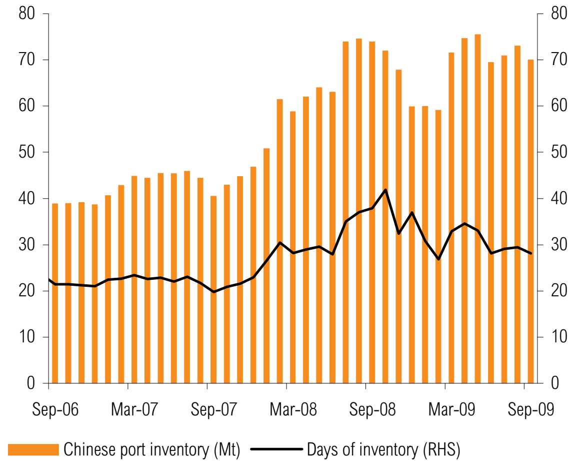


Source: IISI, RBS estimates

Stock levels starting to decline as end-use improves

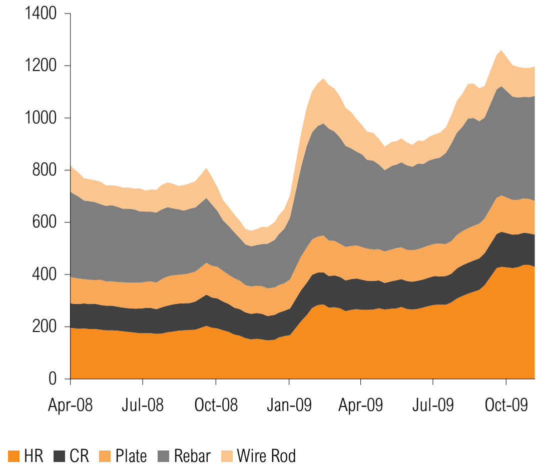
At the time of our October review of the iron ore market, we expressed some concern over how much of the improvement in iron ore demand was due to restocking and if growth in Chinese steel inventory would lead to an eventual collapse in steel production. The chart below (left) shows that Chinese iron ore inventories at the major ports have started to decline and that inventory in terms of days of consumption has now fallen below 30 days. Steel inventories shown in the chart below (right) look to have peaked in October but it is probably too early to postulate a significant upturn in consumption.

Iron ore at Chinese ports (Mt) and inventory (days)



Source: CEIC, RBS estimates

Chinese steel stocks (Kt)

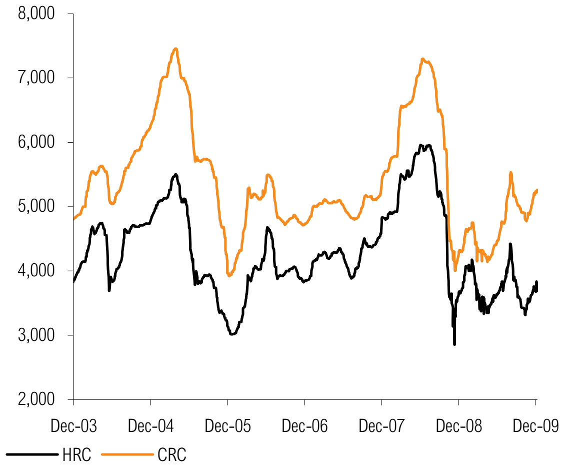


Source: Mysteel, RBS estimates

However, we do take some comfort from the decline in steel stocks at a time when steel production is at record levels. Anecdotal evidence from Chinese construction and infrastructure companies also suggests that the Chinese stimulus package is moving from the planning to the spending stage.

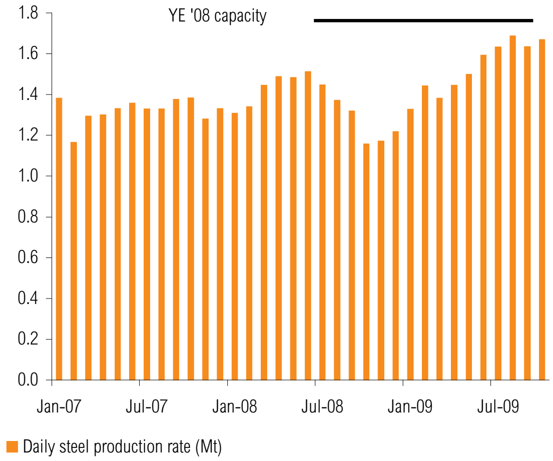
Moving into 2010, we are forecasting ongoing growth in steel production globally and a continuation in Chinese steel capacity growth. The Chinese Government has tried putting stricter controls on future capacity additions and existing capacity but these appear to be more at the margin rather than having a substantial impact on the market. China's MIIT recently reiterated an intention to close 21Mt of iron making capacity and 17Mt of steelmaking capacity in 2009, compared with the October annualised steel production rate of 621Mtpa. While prices of rebar and HRC sit in the Rmb3,000-4,000/t range, it appears unlikely that we will see a significant drop in production. If there is going to be a crunch in excess capacity, we believe that it will come in 2011. In the meantime, China and other steel producer countries need to ensure that their economies do not slip into recession in 2010.

Chinese steel prices stabilise (Rmb/t)



Source: Bloomberg

Monthly Chinese steel production rate (Mt)



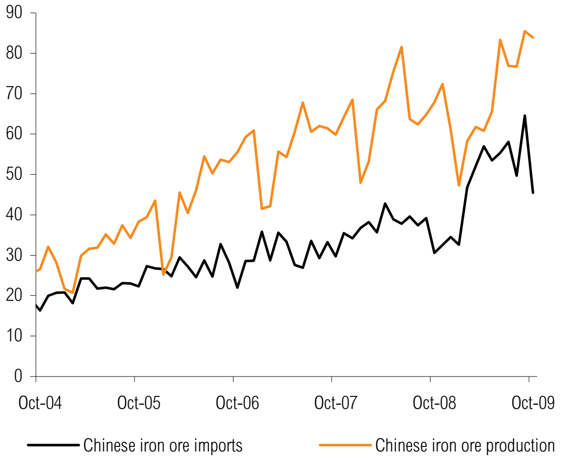
Source: CEIC

Iron ore supply growth required

We are forecasting global steel production to rise 10% in 2010, requiring shelved iron ore expansion plans to be reinstated and ongoing increases in Chinese domestic production. We expect traditional suppliers to meet the requirements of non-Chinese producers with miners such as Vale and BHP recommitting to expansion plans.

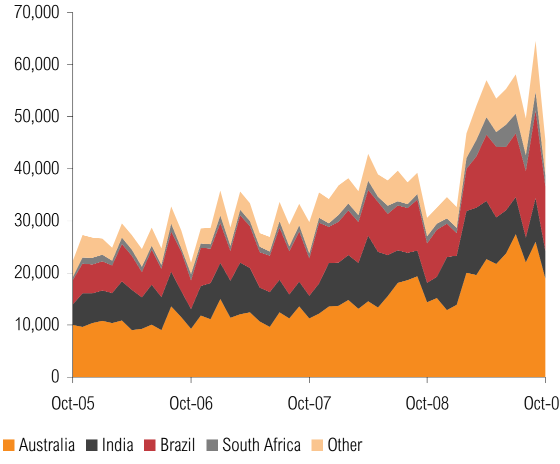
In our view, Rio Tinto will also revisit the expansion of Pilbara production from 220 to 320+Mtpa in 2010 when management gains more confidence in the market outlook and the company's balance sheet. Expansion options for Vale, BHP and RIO, plus numerous developments by the juniors should fill the deficit in the market we are currently showing in 2015 based on currently committed developments. In the meantime, supply-demand fundamentals are finely enough balanced to see entrants come into the market.

Chinese iron ore production and imports (Mt)



Source: CEIC

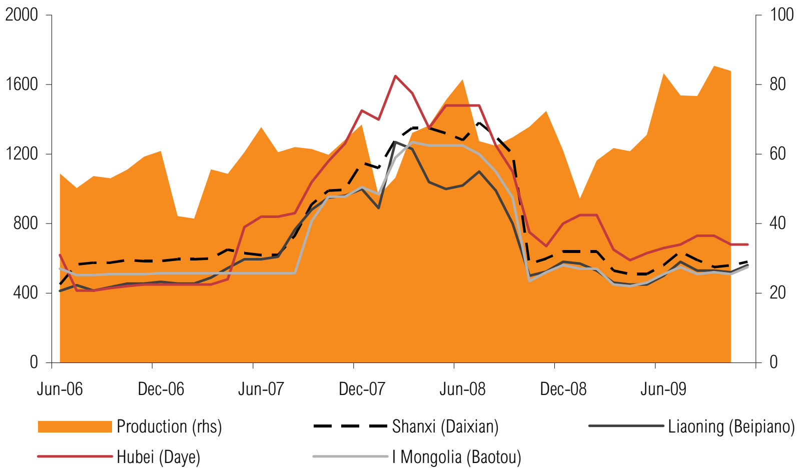
Source of Chinese iron ore imports (kt)



Source: CEIC

Chinese domestic iron ore production is also likely to increase as integrated mines and town/provincial mines become cash positive following the recovery in domestic price and what we believe will be future price increases in line with rising import prices. The chart below shows that even without a dramatic improvement in pricing, domestic iron ore production has almost doubled since the January lows. In our view, it is not much of stretch to believe that domestic production will increase if a price incentive is offered to the miners.

Chinese iron ore production (Mt - RHS) and regional prices (Rmb/t)



Source: CEIC, Bloomberg

A direct relationship between Chinese domestic prices and import prices is not straightforward because of:

- the distance between mines and steel mills;
- the level of integration or co-dependency of mines and mills;
- the moisture content;
- the iron content; and
- the bargaining power of the non-integrated mines.

However, if we use Liaoning and Hebei prices as a notional benchmark as these two provinces account for 15% and 40% of Chinese production, respectively, Chinese iron ore appears to be maintaining a 20% discount to imported iron ore from a Chinese steel producer's perspective.

Comparison of typical domestic and imported iron ore prices

Imported iron ore prices

Port	Origin	Brand	Fe content %	Moisture %	Price (Rmb/ wmt)	Price (Rmb/ dmt)	US$/ wmt	US$/ dmt	US$/ dmt (pre import tax)	US$/dmt (pre-tax basis 62% Fe)	USc/ dmtu
Qingdao	India	Generic fine	63.5	8.0	780	848	114	135	112	109	176
Qingdao	India	Generic fine	62.0	8.0	745	810	109	129	107	107	173
Qingdao	Brazil	Generic fine	65.0	8.0	835	908	122	145	120	114	185
Rizhao	Brazil	Generic fine	64.5	8.0	835	908	122	145	120	115	186
Rizhao	AUS	PB fine	61.5	7.0	790	849	116	134	111	112	181
Lianyungang	AUS	PB fine	61.5	7.5	785	849	115	134	112	112	181
Tianjin	Brazil	Crude ore	59.0	8.0	850	924	125	147	122	128	207
Tianjin	AUS	PB fine	62.0	7.5	805	870	118	138	114	114	184
Tianjin	AUS	PB lump	62.0	4.0	850	885	125	135	112	112	181

Domestic concentrate prices

Province	Origin	Brand	Fe content %	Moisture %	Price (Rmb/t) ex VAT	Price (Rmb/t) inc VAT	US$/t inc VAT	US$/t exc VAT	US$/t (pre-tax basis 62% Fe)	US$/t inc VAT	US$/ t exc VAT	US$/dmt (pre-tax basis 62% Fe)	USc/ dmtu
Shanxi	Daixian	Generic	64.0		487	570	83	71	69	83	71	69	112
Guangdong	Huaji	Generic	66.0	wet 6.0	470	550	81	69	65	86	73	69	111
Shandong	Luzhong/Jinling	Generic	65.0	wet 6.0	756	885	130	111	106	138	118	112	181
Liaoning	Beipiao	Generic	66.0	wet 6.0	525	614	90	77	72	96	82	77	124
Liaoning	Gongchangling	Generic	65.0	wet 6.0	525	614	90	77	73	96	82	78	126
Liaoning	Fushan	Generic	66.0		607	710	104	89	84	104	89	84	135
Jilin	Tonghua	Generic	66.0		590	690	101	86	81	101	86	81	131
Hubei	Daye	Generic	63.0		615	720	105	90	89	105	90	89	143
Anhui	Fanchang	Generic	64.0		701	820	120	103	99	120	103	99	160
Hebei	Tangshan	Generic	66.0	wet 6.0	714	835	122	105	98	130	111	104	168
Hebei	Handan-Xingtai	Generic	66.0		701	820	120	103	96	120	103	96	156
Average price					608	712	104	89	85	107	92	87	141
Notional domestic benchmark					614	719	105	90	85	105	90	85	136
Domestic price relative to import price (normalised)												Discount	21%

Source: Mysteel, RBS estimates

Freight rates to China (US$/t)

From	Dec-08	Dec-09
India	<10	20+
Brazil	<10	45
Aust	5+	15+

Source: RBS Sempra

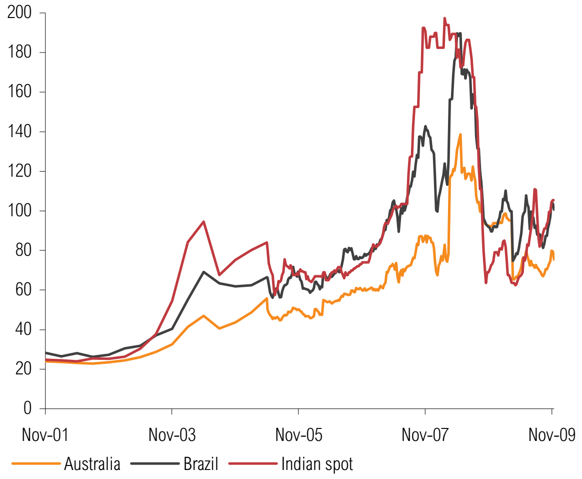
Brazil no longer a cheap alternative, just an alternative

In 2009, steel producers have benefitted from a surplus of ships, lower bunkers, and lower ore prices. Sea freight is currently less than half the mid-2008 peak and is not having an adverse impact on iron ore demand, in our view. The more than doubling of freight rates since the end of 2008 is reflection of the turnaround in Chinese demand to record levels. But it is creating a potential problem for Brazilian iron ore. The rally in Brazilian freight has led to the landed cost of contracted Brazilian iron ore now being around parity to spot iron ore from India.

To date Brazilian ore has been cannibalising Indian market share. While this may in part be related to shipping issue out of India and the crackdown by Indian government officials on miners infringing mining and environmental rules, it probably also implies that the Chinese steel mills are happy to pay for the quality even if it is no longer being landed at a discount to spot.

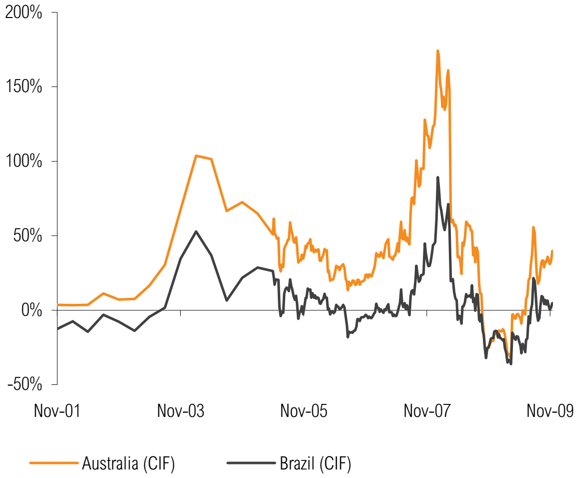
The problem for Vale is that based on the discount in the Australian landed price in China to that of ore sourced from India or Brazil, we feel that BHP and Rio will once again ask for a premium to offset the shipping benefit. Will Vale be happy to accept a similar outcome to two years ago? We don't know but it isn't going to make price negotiations easy. Such an outcome could also play into BHP's hands as it may act as a catalyst for consumers to accept BHP offer of index pricing rather than what might be a 10-15% location premium. Another complication on pricing is CISA – it is still calling for a single China price irrespective of the source and with no linkage to European or Japanese benchmark settlements.

CIF price in China (US$/wmt)



Source: Reuters, RBS estimates

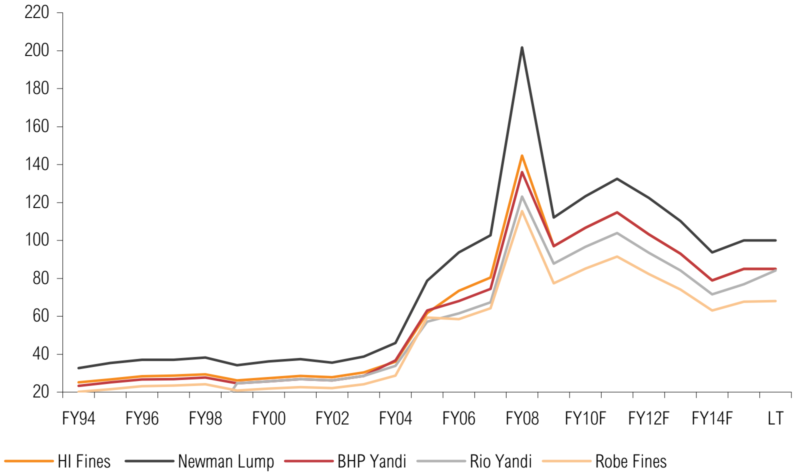
Indian premium to Australia and Brazil iron ore (landed China)



Source: Reuters, RBS estimates

We foresee a long and painful period of negotiations for 2010 iron ore benchmark prices or whatever the iron ore producers or consumers wish to call the clearing price for non-spot tonnage.

Iron price profile (USc/dmtu)



Source: TEX, Company data, RBS forecasts

RBS Iron ore price forecasts (FOB Australia)

Year-end 31 March	2007A	2008A	2009A	2010A	2011F	2012F	2013F	2014F	2015F	LT
Fines – USc/dltu	**74.64**	**81.73**	**146.98**	**98.56**	**118.27**	**130.09**	**117.09**	**99.52**	**89.57**	**86.36**
- USc/dmtu	73.46	80.44	144.67	97.00	116.41	128.05	115.24	97.96	88.16	85.00
- US$/t @ 62%Fe/7% moisture	42.4	46.4	83.4	55.9	67.1	73.8	66.4	56.5	50.8	49.0
% change yoy	**19.0**	**9.5**	**79.9**	**-32.9**	**20.0**	**10.0**	**-10.0**	**-15.0**	**-10.0**	**-3.6**
% change from previous forecast	-	-	-	-	9	12	12	5	12	0
Lump – USc/dltu	**95.25**	**104.29**	**204.94**	**113.80**	**136.56**	**150.21**	**135.19**	**114.91**	**103.42**	**101.60**
- USc/dmtu	93.75	102.65	201.71	112.01	134.41	147.85	133.06	113.10	101.79	100.00
- US$/t @ 62%Fe/4% moisture	55.8	61.1	120.1	66.7	80.0	88.0	79.2	67.3	60.6	59.5
% change yoy	**19.0**	**9.5**	**96.5**	**-44.5**	**20.0**	**10.0**	**-10.0**	**-15.0**	**-10.0**	**-1.8**
% change from previous forecast	-	-	-	-	9	12	9	3	9	0

Source: TEX, RBS forecasts

RBS world iron ore supply-demand balance – 2005-15F

(Mt)	2005E	2006E	2007E	2008E	2009F	2010F	2011F	2012F	2013F	2014F	2015F
Total iron ore production	**1,544**	**1,781**	**1,991**	**2,122**	**2,167**	**2,249**	**2,368**	**2,456**	**2,571**	**2,638**	**2,653**
% change	15.8	15.4	11.8	6.6	2.1	3.8	5.3	3.7	4.7	2.6	0.6
Total steel production	1,104	1,216	1,317	1,302	1,206	1,332	1,401	1,477	1,558	1,638	1,714
% change	6.5	10.2	8.3	-1.2	-7.4	10.5	5.2	5.4	5.5	5.1	4.6
Chinese steel production	348	421	487	498	575	658	704	760	821	878	931
% change	26.9	21.1	15.6	2.2	15.6	14.3	7.0	8.0	8.0	7.0	6.0
% of total	31.5	34.6	37.0	38.3	47.7	49.4	50.2	51.5	52.7	53.6	54.3
Total steel production from iron ore (primary)	**751**	**826**	**909**	**898**	**832**	**912**	**960**	**1,012**	**1,068**	**1,122**	**1,174**
% change	9.7	10.0	10.0	-1.2	-7.4	9.7	5.2	5.4	5.5	5.1	4.6
Total iron ore demand	**1,549**	**1,789**	**2,024**	**2,091**	**2,053**	**2,252**	**2,353**	**2,454**	**2,514**	**2,614**	**2,710**
% change	15.5	15.5	13.2	3.3	-1.8	9.7	4.5	4.3	2.5	4.0	3.7
Supply-demand balance (under/over-capacity)	**-5**	**-7**	**-33**	**31**	**114**	**-3**	**15**	**2**	**57**	**24**	**-56**
Ave iron ore price change	72%	19%	9.5%	96.5%	-44.5%	20%	10%	-10%	-15%	0.0%	0.0%

Source: IISI, TEX, RBS forecasts

Coal

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Thermal off the lows but no time for a spike

The thermal coal market has turned somewhat bi-polar. The Asian market is reflecting the impact of arbitrage pricing between Australia, Indonesia and domestic Chinese production. Elsewhere in Asia, demand appears to be relatively weak from lacklustre Industrial demand. In the European market, coal is being displaced by cheap gas supply and some South African coal appears to be finding its way into the Pacific Basin. As discussed in the October 2009 Companion we believe that thermal prices will be driven by the pricing of Chinese domestic coal relative to low-grade Indonesian coal or Australian/South African product. We do not see this changing in the short term and upgrade our thermal coal price forecasts by US$5/t to US$80/t in 2010/11.

While China may have led the demand charge, Australian producers are now reporting an improvement in demand from traditional customers

Metallurgical coal prices benefit from demand growth and limited supply reaction

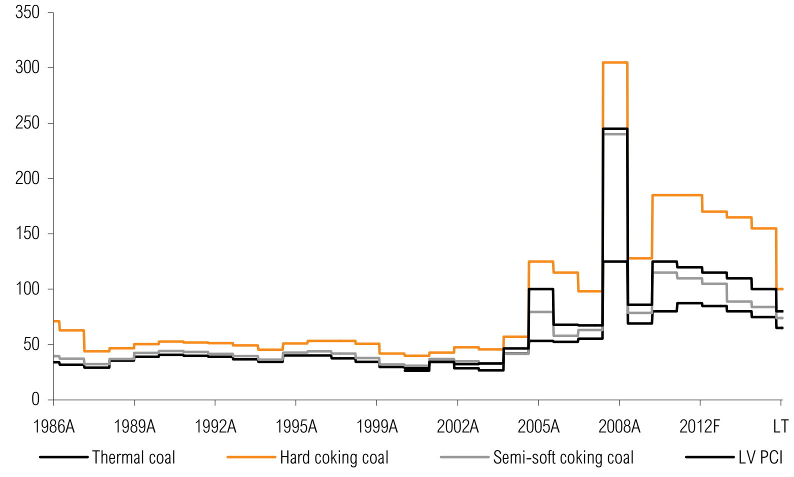
Growth in Chinese steel production and what appears to be a bottoming in other Asian steel production has led to a firming up of all metallurgical coal types. While China may have led the demand charge, Australian producers are now reporting an improvement in demand from traditional customers. Producers that had braced themselves for a dramatic fall in Asian and European demand by factoring in capacity reductions are now struggling to meet some contract tonnage and have limited or no tonnage available for spot sales.

An increase in the thermal coal price from US$69 to 92/t and hard coking coal price from US$128 to 170/t would only just absorb the impact of the AUD appreciation

Currency strength and costs will be a feature of contract negotiations

The lack of any dramatic downward cost change in the Australian coal industry, the cost of paying for new infrastructure and a 33% appreciation in the A$ will play a significant role in 2010/11 contract and spot prices. Even if coal producers fail to pass on the cost/capital pressures and react to supply/demand pressures, an increase in the thermal coal price from US$69 to 92/t, semi-soft price from US$78 to 105/t, LV PCI price from US$86 to 115/t and hard coking coal price from US$128 to 170/t would be needed just to absorb the impact of the AUD appreciation.

Metallurgical and thermal coal benchmark (US$/t FOB)



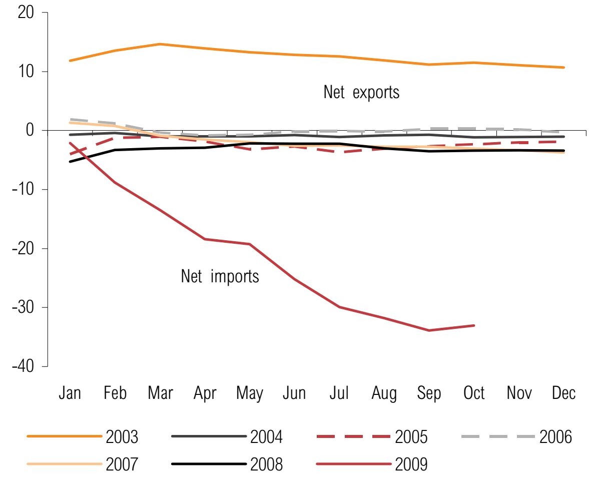
Source: TEX, Wood Mackenzie, Company data, RBS forecasts

China rescued prices but what now?

The current market for coal looks robust to say the least

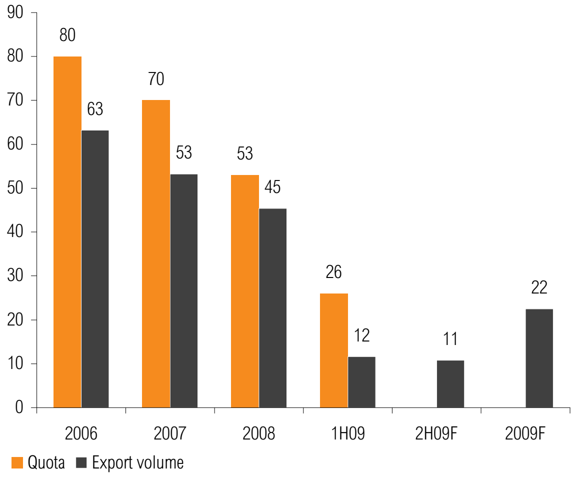
As discussed in our October Commodity Companion, producers and coal traders started seeing China as a much more active market participant in term contract negotiations and as an ongoing spot buyer of coking coal (if available) in March and June quarters. With the return of traditional Australian coal consumers, prices over the September quarter have strengthened and become somewhat less volatile. We believe that China will continue to utilise imported coal when economics or supply demand are more favourable. In addition, the reduction of Chinese exports plus growth in Indian demand is likely to support higher thermal and metallurgical coal prices.

Annualised net coal trade for China (Mt) – coking, bituminous and anthracite



Source: CEIC

Chinese export quotas vs exports (Mt)



Source: CEIC, RBS estimates

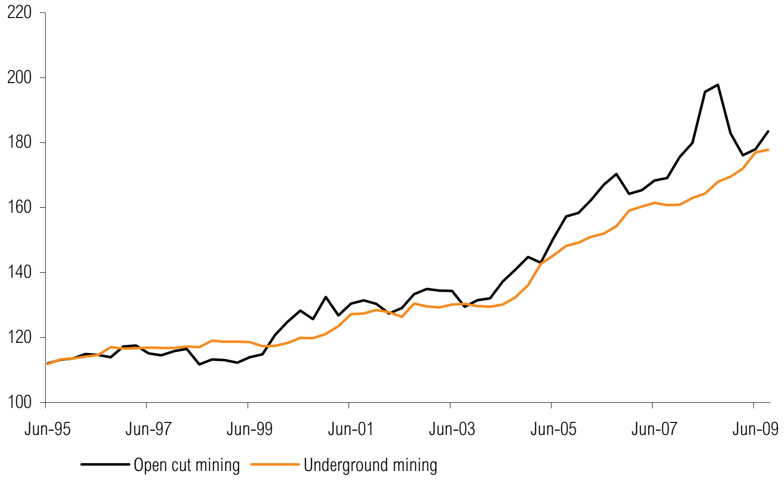
Potential upside for import demand if rationalisation and closures of mines in Shanxi and Hebei occur faster than normal

Whilst there has been some speculation that the Chinese coal industry will become a significant exporter of coal in 2010, we believe this is unlikely. As the chart above (right) shows, even when prices were stronger in 2008, China failed to meet export quotas even on a quarterly basis. We expect restructuring of the Chinese coal sector to continue, as safety concerns and the desire to improve efficiency drive greater share to large producers. The absolute level of import growth may be lower as production from Shanxi and Hebei recovers. It is worth noting that Shanxi Provincial Government expects coal output to fall 5% in 2009 to 620Mt, rising to 670-700Mt in 2010; however the 8-10% increase in 2010 is realistically only likely to meet domestic demand growth rather than make its way to export markets. Another more recent indicator of medium-term tight markets and limited turnaround Chinese exports are the shortages of thermal coal at a number of power plants in Shandong. Supplies have fallen to just 12 days because of delayed shipment from Qinhuangdao and ongoing mine disruptions from Shanxi and Shaanxi.

We maintain our view that the reduction in Chinese exports is not a one-off or that imports will not fall back below 2007 or 2008 tonnages, particularly where the main growth region, Inner Mongolia, would have to compete after meeting the cost of freight. Coal production costs are rising, with policy-related imposts being a key driver for sustainably higher prices. China could also increase imports on a structural basis. In our view, policy action will support domestic prices, while the increase in imports could have a major effect on the seaborne coal market.

From a producer's perspective of the coal market, particularly those in Australia and Canada, foreign exchange movements have led to significant margin reductions and cost reductions appear to have been sustained for only a very limited time. The chart below shows the Australian Bureau of Statistics quarterly cost index for open pit and underground coal mining. Unfortunately for the miners, the fall in diesel fuel and electricity prices had only a short-term impact on costs.

Index of costs in the Australian coal industry – The fall in diesel fuel and electricity prices had only a short-term impact on prices



Source: ABS

Foreign exchange movements and the impact of cost appreciation in domestic currency are likely to lead to protracted negotiations for coal contracts in the CY10 and JFY11. There is no doubt that producers and consumers are feeling tense about what 2010 holds for economic growth but each will try to maximise the potential returns. If demand growth in China and stabilisation or growth in other economies occurs, we believe that coal prices have to rise.

Thermal coal – now less of a buyer's market

Spot market stronger driven by short-term disruption

We believe that the recent strength in thermal prices is being driven by monsoonal impacts on Indonesia shipping, cold weather in Russia and China and the ongoing arbitrage between spot prices in China pulling in import replacement. The broader Asian market does appear to be relatively well supplied, e.g. the Japanese market still appears to have an energy surplus, with nuclear capacity on-line (or offline for maintenance), gas readily available and industrial production still weak. That being noted, Xstrata still negotiated with Chubu to settle at US$74-75/t for Oct '09-Sept '10 contracts (above the previous contract). Presumably, this occurred on the back of a lack of Chinese export thermal coal and Chinese demand for Australian coal at 65-75/t FOB Newcastle. In the lead up to next year's contract negotiations, consumers will be precariously poised – do they contract tonnage at higher prices to ensure delivery or bet on no demand growth for electricity? Certainly not a one-way bet.

Indonesia and India impact on the market may balance out

Over the next two to three years, we believe the dynamics of the thermal coal market will change, with a reduction in the export potential of Indonesia and a potential increase in Indian imports. In our October review, we highlighted the potential increase in domestic Indonesian demand on the back of an aggressive power plant build out. However, it now appears that the government is having difficulty in financing new plants, and the 150Mtpa export cap will not have a dramatic short-term impact on the seaborne thermal coal market. Exports may be less restricted than previously anticipated as the government appears to be happy for coal producers to increase coal exports provided that they are able to meet the domestic demand requirements.

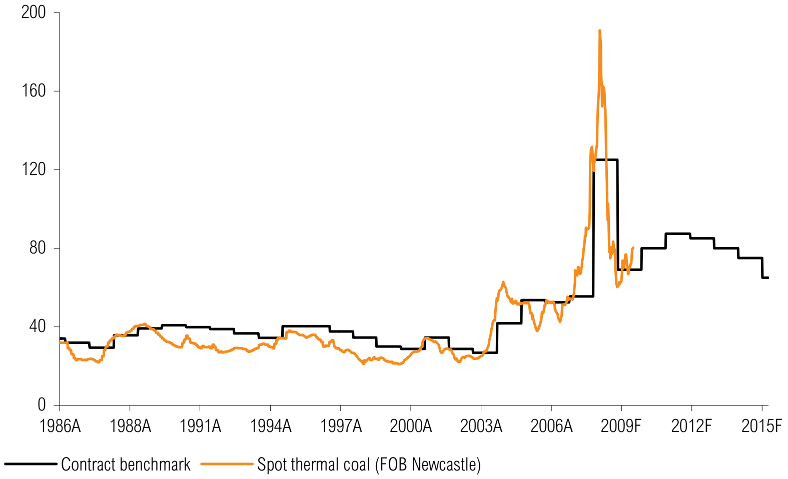
India continues to be a wildcard in import demand. The Central Electricity Authority (CEA) estimates import demand in IFY10-11 of 51Mt, up from an estimated import requirement of 29Mt in IFY09-10. The CEA is predicting even greater demand in IFY11-12 of 87Mt, leading to a tripling in demand over the three-year period. The import growth forecasts also take into account an expectation of domestic coal production of 414mt in IFY11-12.

Pick up in met coal demand to have a positive impact on thermal markets

With the recent pick-up in pricing of semi-soft coking coal, we believe that Australian producers will once again return to washing coal previously sold as thermal to pick up the additional margin or re-optimise mine planning to change the mix. Coal and Allied, one of the major Hunter Valley producers, recently indicated that it would be lifting semi-soft sales in preference to thermal coal.

This probably leaves Australia as a marginal exporter of coal, which, in turn, will necessitate new mine developments and infrastructure builds that, at present, continue to be postponed or lack a degree of economic certainty. At current exchange rates, operating costs and coal prices, the significant production growth options in Australia, like Wandoan and Mt Pleasant, are unlikely to be hurried along.

Thermal coal – FOB Newcastle (US$/t)



Source: Bloomberg, RBS forecasts

In conclusion, our view is that the Asia-Pacific demand is improving although dominated by India and China but a boarder pick-up in demand is required if prices are to fully reflect the depreciation of the USD. Supply is also augmented by the discounted tonne of thermal coal from South Africa finding its way into the region, rather than sitting in boats or stockpiles in Europe, which we believe will have a dampening effect on pricing.

Thermal coal prices are, therefore, only likely to rise enough to secure tonnage from producers currently feeling the impact of FX movements and costs. Without further disruptions, there should be enough coal in the system. However, the market is going to be finely balanced with our overall trade deficit around 5% over the next few years and certainly in the range where a supply shock or further growth in Chinese demand could lead to dramatically higher prices. We are not there yet but we are raising our thermal coal benchmark price from US$75 to US$80/t in JFY11 and from US$77.5/t to US$87.5/t in JFY12. Thereafter, we feel that new infrastructure and mine developments in Australia will see the market trend to an implied oversupply.

Changes to thermal coal price forecasts (FOB Australia)

US$/t, year-end 31 March	2007A	2008A	2009A	2010A	2011F	2012F	2013F	2014F	2015F	LT
Thermal										
Current	52.5	55.5	125.0	69.0	80.0	87.5	85.0	80.0	75.0	65.0
Previous	52.5	55.5	125.0	69.0	75.0	77.5	80.0	82.5	75.0	65.0
Change	0.0	0.0	0.0	0.0	5.0	10.0	5.0	-2.5	0.0	0.0
Change	0%	0%	0%	0%	7%	13%	6%	-3%	0%	0%

Source: TEX, Company data, RBS forecasts

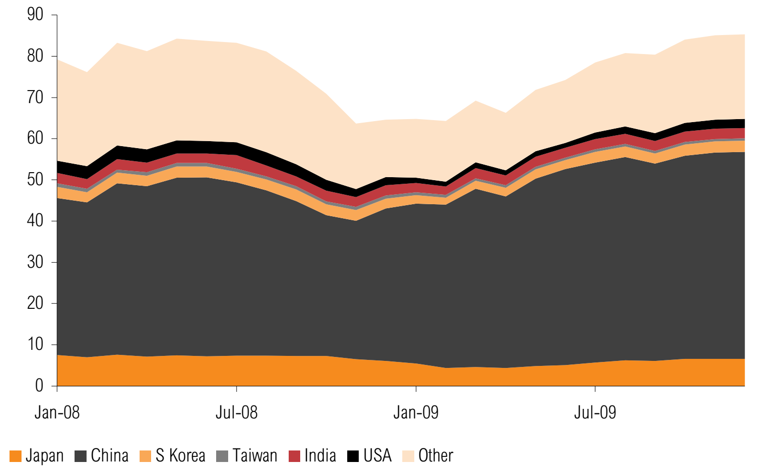
Metallurgical coal rhetoric has started

Metallurgical coal supplies are tight, which should support price outcomes in 2010

A lot has changed since benchmark prices for metallurgical coal for JFY09-10 were settled at US$128/t for premium hard coking coal, US$86/t for LV PCI coal and US$78.50/t for semi-soft coking coal. Those prices reflected a significant amount of uncertainty on the global steel outlook. The 33% growth in monthly Chinese blast furnace steel production since the start of the year, followed by increases in Korean, Taiwanese and Japanese production over the last six months, has led to an improvement in seaborne demand for metallurgical coal. Not surprisingly coal producers also commented that in the first nine months of 2009, China was the dominant buyer, and that it has really only been over the last 4-5 months that traditional buyers have returned to the market seeking contract tonnage.

The return of traditional Asian buyers and the ongoing Chinese demand has led to considerable tightening in the market and spot prices for hard coking coal of US$175-185/t, LV PCI of US$120/t, and semi-soft coking at US$115/t. **For coal producers, this is a good environment for CY10 or FY10/11 price negotiations.**

Blast furnace steel production (Mt)



Source: IISI

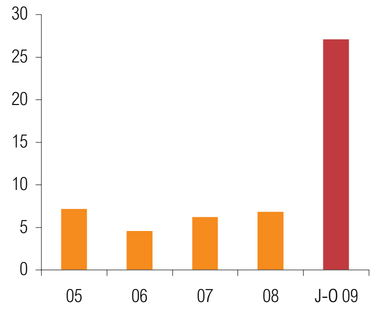
Chinese demand flattening out but provides competition in the market for Japan and Korea

China has moved from being a small net importer of coking coal (less than 5Mtpa over the past five years) to a significant net importer with annualised net imports (imports minus exports) running at 30Mtpa in October. Our view is that imports will become price sensitive over the 4Q09 and 1Q10 but will not collapse. It also appears that traditional buyers feel the same way as Platt's, Reuters, and producers have reported that long-term customers are trying to lock in future deliveries.

Platt's coverage of carbon week in Lisbon posted some interesting quotes from participants: "Some Australian coking coal producers are becoming sold out for 2010 and are holding back tonnes for their existing customers" and "Chinese imports will absorb the 35mt of global production growth in 2010". We do feel panic levels rising from the consumer's perspective.

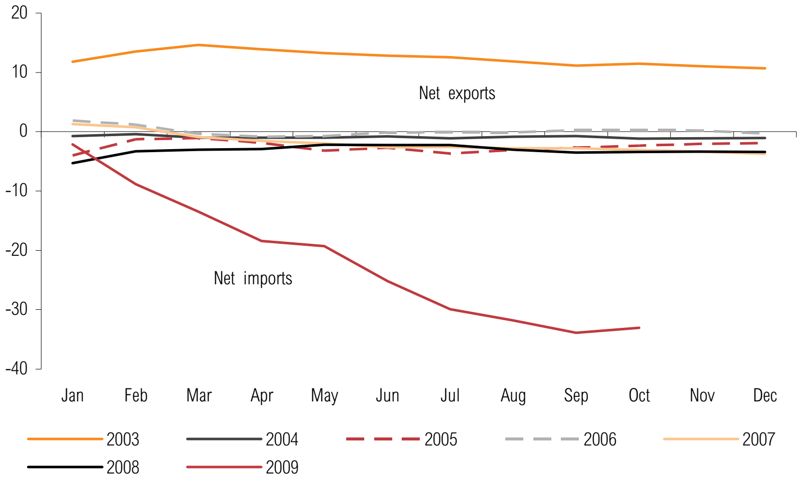
We think the thoughts of holding back coal may be a touch conspiratorial – in recent meetings with coal producers, we got the impression that companies would be happy to take advantage of high spot prices but they do not have any available. To this end, US coal producers are now back in the Asian market and able to sell coal at an equivalent CFR price to that available from Australia.

Chinese annual coking coal imports (mt) – 2009 = Jan-Oct



Source: CEIC, RBS

Chinese monthly coking coal trade (annualised, Mtpa)



Source: CEIC

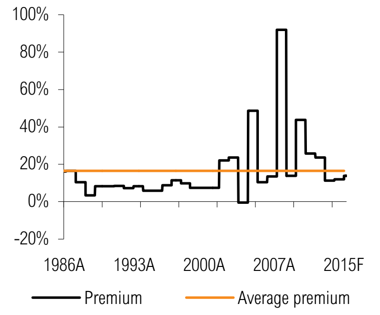
Hard coking coal market tight – consumers praying for no rain

We believe that there is limited flexibility in the mining and outload system and this could see the market tighten even further in H2 09 if demand remains at current levels over the next six months. The joker in the pack will be the weather in Queensland. If we do get a recurrence of the 2008 floods, hard coking coal prices will certainly exceed the US$200/t into next year.

Preparing for structural change on two fronts

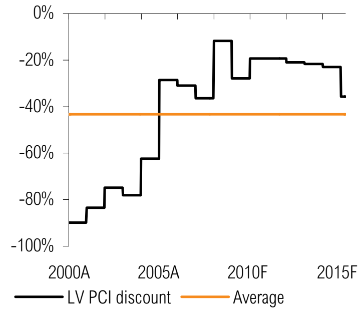
The negotiations for the 2010/11 contract prices are likely to be even more complex than they have been in the past. BHP Billiton, the largest seaborne metallurgical coal producer has informed its customers in Japan (and presumably elsewhere) that it wants to adopt a pricing mechanism in which prices are settled quarterly or every six months instead of annually. To date, the answer from the Japanese has been a categorical – no thanks – which is understandable given the Japanese industry's avoidance of change.

Semi-soft coking coal premium to thermal coal



Source: TEX, RBS forecasts

LV PCI discount to premium hard coking coal



Source: TEX, RBS forecasts

However, with BHP supplying around half of Japan's hard coking coal, it may be difficult to hold out for no change whatsoever. On the flip side, we can see benefit to the steel producers in that they may be better able to match their input costs to the steel prices. However, we do foresee issues between negotiating parties on what are acceptable profit margins for coal and steel.

Secondly, the rationalisation of smaller steel mills in China is likely to lead to greater consumption of premium hard coking coal rather than the mix currently consumed by smaller provincial or city mills that may be less concerned about productivity and quality and more about price. This situation could also be exacerbated by the relative prospectivity of metallurgical coal in China; most discoveries reported in the press appear to be thermal.

Semi-soft rises on the back of hard coking coal prices and limited supply

The biggest spot versus contract gains have come in semi-soft, which is up 46% in US$ terms, which we believe is due to many of the producers not washing their semi-soft plys and selling the coal as thermal coal or simply optimising production towards thermal which was more buoyant early in the year. This has led to an acceleration in the tightening of the market as hard coking prices rose and consumers moved to cheaper alternatives.

LV PCI demand returns with the requirement for cheaper carbon

We believe the link between PCI and hard coking coal prices is reverting to levels last seen after 2006 (i.e., PCI at a 25-30% discount to premium hard coking coal) as the stronger segments of the steel industry seem prepared to bid up prices for higher-quality coal. India and China are now becoming ongoing consumers, and traditional buyers are returning to the market and are booking tonnage for next year.

Changes to metallurgical coal price forecasts (FOB Australia)

(US$/t, year-end 31 March)	2007A	2008A	2009A	2010A	2011F	2012F	2013F	2014F	2015F	LT
Hard coking coal										
Current	115	98	305	128	185	185	170	165	155	100
Previous	115	98	305	128	150	150	145	145	145	100
Change	0	0	0	0	35	35	25	20	10	0
Change	0%	0%	0%	0%	23%	23%	17%	14%	7%	0%
Semi-soft coking coal										
Current	58	63	240	78.5	115	110	105	89	84	74
Previous	58	63	240	78.5	84	87	90	92	92	74
Change	0	0	0	0	32	23	16	-2	-7.5	0
Change	0%	0%	0%	0%	38%	26%	17%	-2%	-8%	0%
LV PCI coal										
Current	68	68	245	86	125	120	115	110	100	80
Previous	68	68	245	86	98	98	90	90	90	80
Change	0	0.0	0	0	27	22	25	20	10	0
Change	0%	0%	0%	0%	28%	22%	28%	22%	11%	0%

Source: TEX, Company data, RBS forecasts

Supply-demand assumptions for seaborne thermal coal (Mt)

Imports (mt)	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**	**2014F**	**2015F**
Japan	118	115	121	124	114	108	110	112	115	117	119
South Korea	57	60	66	74	78	84	91	98	106	114	123
Taiwan	53	54	56	53	53	54	55	57	60	61	61
China	19	33	42	31	69	74	80	84	88	93	98
Hong Kong	11	11	11	11	11	11	11	11	11	11	11
Israel	13	13	14	14	14	14	14	14	14	14	14
Malaysia	10	12	13	14	15	17	17	18	19	20	21
India	18	24	27	35	40	44	50	57	61	66	71
Other	21	23	25	27	28	29	31	32	34	36	37
Asia	**320**	**344**	**375**	**383**	**422**	**435**	**458**	**484**	**508**	**531**	**556**
Europe	**195**	**204**	**198**	**200**	**197**	**199**	**204**	**209**	**214**	**220**	**225**
Canada	17	16	17	17	17	17	17	16	16	15	15
USA	26	31	32	32	31	31	30	29	28	27	25
Mexico	5	6	7	7	7	8	8	8	8	8	8
North America	**47**	**54**	**55**	**56**	**56**	**55**	**54**	**53**	**51**	**50**	**49**
South/Cent. America	**9**	**9**	**10**	**10**	**10**	**10**	**11**	**11**	**11**	**12**	**12**
Africa	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**6**
Oceania	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Thermal Coal Imports	**576**	**616**	**642**	**653**	**690**	**705**	**733**	**762**	**791**	**818**	**848**
% yoy change	6%	7%	4%	2%	6%	2%	4%	4%	4%	4%	4%

Exports (Mt)	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**	**2014F**	**2015F**
Australia	109	113	115	122	141	149	167	192	230	288	317
China	61	54	51	41	21	17	15	13	11	10	9
Vietnam	13	23	28	20	25	23	20	17	15	12	11
Indonesia	124	164	177	170	175	170	165	161	158	155	152
Asia/Pacific	**306**	**354**	**371**	**353**	**361**	**359**	**367**	**383**	**415**	**466**	**489**
United States	19	20	24	26	18	18	16	15	13	12	11
Canada	1	3	4	4	4	5	5	5	5	5	6
Colombia	54	56	63	72	76	82	89	94	100	106	112
Venezuela	6	6	6	6	6	7	7	7	7	8	8
Nth/Cent/Sth America	**80**	**85**	**97**	**109**	**105**	**112**	**117**	**121**	**126**	**131**	**136**
South Africa	73	66	66	65	67	69	71	73	75	78	80
Poland	18	13	10	9	9	9	9	9	9	9	9
Russia	64	77	84	88	90	92	94	95	97	99	101
Kazakhstan	28	27	28	28	29	29	30	30	31	32	32
Other	8	8	8	9	9	10	11	12	14	16	18
Thermal Coal Exports	**576**	**629**	**664**	**661**	**670**	**679**	**698**	**724**	**766**	**830**	**865**
% yoy change	6%	9%	6%	0%	1%	1%	3%	4%	6%	8%	4%
Trade Surplus/(Deficit)	**0**	**13**	**22**	**8**	**-21**	**-26**	**-35**	**-38**	**-24**	**11**	**17**
% of imports		2%	3%	1%	-3%	-4%	-5%	-5%	-3%	1%	2%
Annual Increase	**34**	**53**	**35**	**-3**	**9**	**9**	**19**	**26**	**42**	**63**	**36**
% increase yoy	6%	9%	6%	0%	1%	1%	3%	4%	6%	8%	4%

Source: TEX, RBS forecasts

Supply-demand assumptions for seaborne metallurgical coal (Mt)

Exports (mt)	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**	**2014F**	**2015F**
Australia	122	122	135	132	129	137	148	160	173	186	209
Indonesia	5	6	7	7	7	7	7	7	8	9	9
China	6	5	4	4	4	3	2	1	1	0	0
Asia/Pacific	**133**	**133**	**146**	**143**	**140**	**147**	**157**	**168**	**181**	**195**	**218**
United States	26	24	19	22	22	23	23	22	22	22	22
Canada	27	30	32	35	33	33	35	38	40	42	44
Colombia	2	2	3	3	3	3	3	3	3	3	3
Cent/Nth/Sth America	**54**	**56**	**53**	**59**	**58**	**59**	**60**	**63**	**65**	**67**	**69**
Poland	3	3	3	3	3	3	3	3	3	3	3
Russia	15	13	13	13	14	14	14	14	15	15	15
South Africa	3	2	3	3	3	3	3	3	3	3	3
Other	8	8	9	10	11	12	13	15	19	20	21
Total Exports	**217**	**216**	**226**	**231**	**227**	**237**	**250**	**267**	**285**	**303**	**328**
Annual Increase	**6**	**-1**	**10**	**5**	**-4**	**10**	**13**	**17**	**19**	**17**	**25**
% yoy change	3.6%	3.8%	3.6%	2.1%	-1.6%	4.3%	5.5%	6.7%	7.1%	6.1%	8.4%

Imports (mt)	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**	**2014F**	**2015F**
Japan	63	62	63	64	59	60	61	63	64	64	64
South Korea	18	18	17	20	18	19	20	21	21	21	21
Taiwan	8	8	9	9	8	8	8	8	8	8	8
China	8	5	6	6	32	35	38	43	47	52	57
India	19	21	23	24	26	29	34	41	48	56	65
Other	4	3	3	3	3	3	3	3	3	3	3
Asia/Pacific	**120**	**117**	**120**	**125**	**147**	**153**	**164**	**178**	**190**	**203**	**218**
EU	49	50	50	51	51	52	52	53	53	54	54
Other Europe	28	24	23	22	22	21	20	20	19	19	18
Europe	**77**	**74**	**73**	**73**	**73**	**73**	**73**	**73**	**72**	**72**	**72**
North America	8	8	8	8	7	7	7	7	7	7	7
Brazil	14	18	20	21	15	16	18	19	21	23	26
Other	2	2	2	2	2	2	2	2	2	2	2
Nth/Sth/Cent. America	**24**	**28**	**30**	**32**	**24**	**25**	**27**	**29**	**30**	**32**	**35**
Africa	**4**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Metallurgical Coal Imports	**224**	**224**	**229**	**235**	**249**	**256**	**268**	**284**	**298**	**313**	**330**
Annual Increase	**3**	**0**	**5**	**6**	**14**	**7**	**12**	**16**	**14**	**15**	**17**
% yoy change	1.2%	-0.2%	2.1%	2.7%	6.2%	2.9%	4.6%	5.8%	5.0%	4.9%	5.4%
Trade surplus/(deficit)	**-7**	**-8**	**-3**	**-4**	**-22**	**-20**	**-18**	**-17**	**-13**	**-10**	**-2**
% of imports	-3%	-4%	-1%	-2%	-9%	-8%	-7%	-6%	-4%	-3%	0%

Source: TEX, RBS forecasts

Crude Oil

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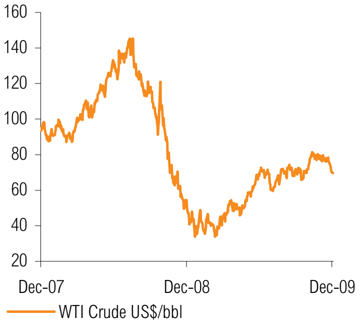
Waiting for reality to catch up with prices

We characterise today's crude oil market as one that is waiting for reality to catch up with price. At US$80 per barrel, the oil market had fully priced in an economic recovery. But as it has become clear that the effects of the great de-leveraging of 2008/2009 will extend into 2010, the prompt price of oil has been under increasing pressure.

WTI crude oil - US$80/bbl proving a difficult hurdle



Source: Bloomberg, RBS

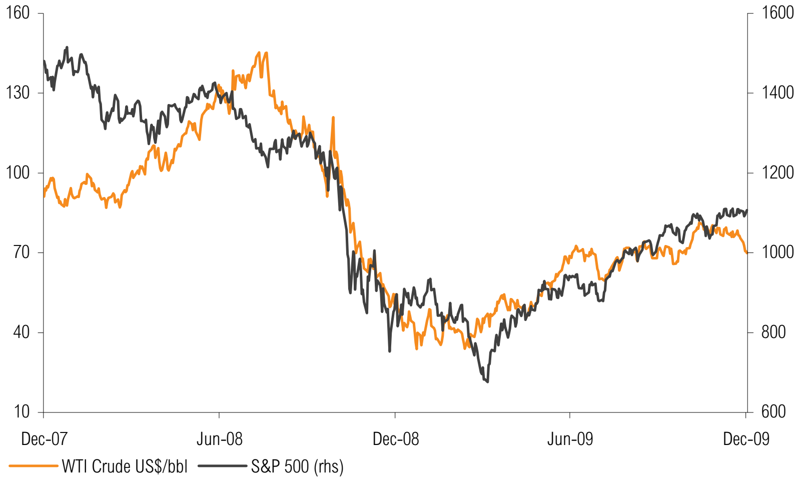
One key lesson from 2007 is that the crude oil market will not tolerate pricing which leads to cancellations of existing non-OPEC projects. In retrospect for 2009, cancellation or delay of oil sands projects was clearly a major bullish flag. The good news is that current prices are bringing cancelled or delayed projects back online. Most notably, we have recently seen Suncor Energy revive investment in its **Firebag** expansion, investing US$950 million in its 2010 capital expenditure plans. Suncor noted the 136,000 b/d project could be supported from free cash flow at "mid-cycle" crude prices.

Likewise, the market needs to see continued OPEC investment, and it is in many respects fortunate that OPEC investment appears to have been relatively unaffected by the price shock of 2009. Saudi Arabia has brought the 1.2m b/d **Khurais** project online and the next mega-project, the 900,000 b/d heavy oil **Manifa** field, is on track.

However, if US$70-80 oil appears sufficient to keep mega projects on track, the near-term outlook for crude oil does not appear to have dramatic upside potential. Inventories remain a bearish weight on the front of the market, OPEC commentary is dovish, and the market will need to see an increased 'Call on OPEC' to break through US$80/barrel in mid-to long-term. We believe the global oil market will remain rangebound in the first half of 2010 as inventories are slowly worn down. Those inventories will also ensure that the oil market remains in a solid contango structure with WTI remaining a relatively inexpensive crude.

We have one wish for Santa Claus this year: the global crude market in 2010 stops trading in lockstep with currency and equity movements. The oil market is a big boy now and 2010 is a good time for the oil market to grow up and determine its own destiny.

S&P 500 vs prompt WTI crude oil – 2010 is a good time for the oil market to grow up and determine its own destiny

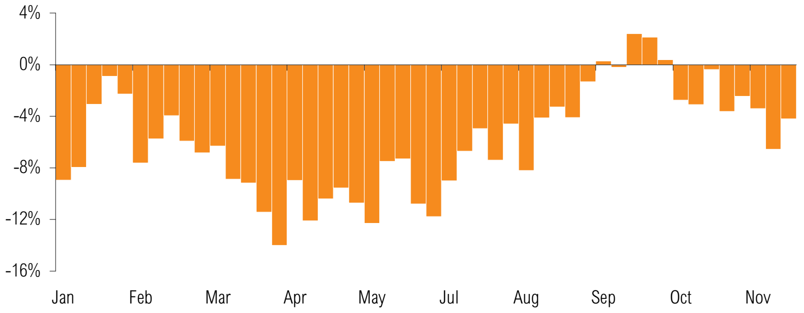


Source: Bloomberg, RBS

Demand and Inventories: Still bearish

We are optimistic about North American growth in 2010 and with that optimism comes a belief that in 2010 we will see an above trend recovery in oil demand growth. From 2000 to 2008, the average annual growth in global oil demand has been 1.08m barrels per day. The IEA is currently forecasting growth of 1.4m bbl per day in 2010 and we believe the number is likely to be exceeded. Still, it is fair to say recent demand data has been disappointing and suggests demand in October and November has stalled in the US.

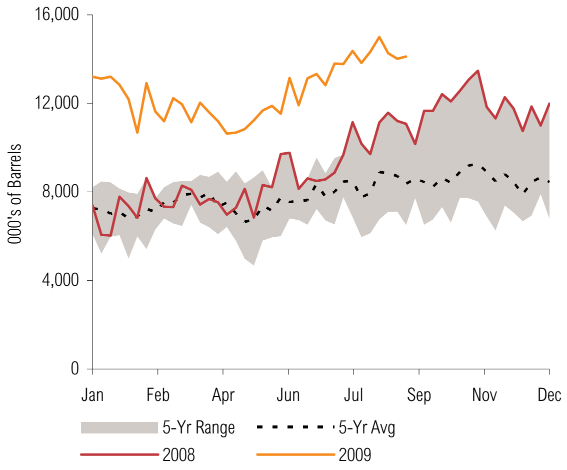
US total petroleum product demand, yoy change – US petroleum demand recovery has stalled



Source: EIA, RBS Sempra

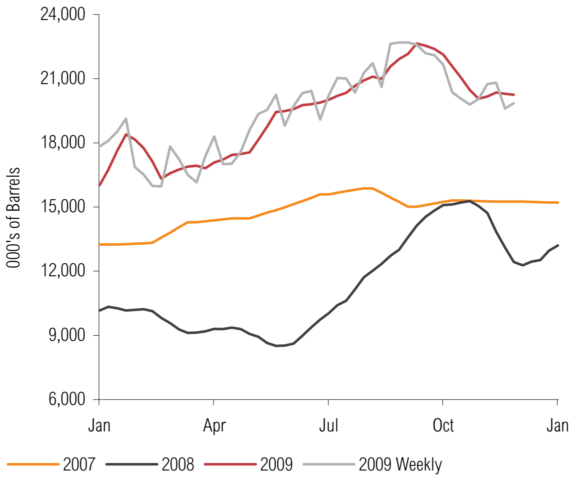
So, while US demand is up sharply since the dismal days of Q2 2009, recent recovery has been hard to see. This weak demand, in turn, is limiting the ability of refiners to produce, and keeping inventories elevated. One of the big surprises to us since the October Commodity Companion is that as bad as inventories were then, they look if anything even worse now. For oil and product markets, the most important of these inventories are the floating storage markets. **It currently appears that 17 VLCCs are floating on the water representing perhaps 35m barrels of crude oil.** With crude oil spreads having widened quite dramatically in recent weeks, it is probable that if anything these stocks are growing, not shrinking into the end of the year. It also appears probable that the world will carry so much gasoil/distillate stock through the core of winter and floating storage of gasoil, which could be of a similar scale to crude. Meanwhile, the onshore stocks of distillate around the world continue to look very problematic.

Singapore middle distillate stocks



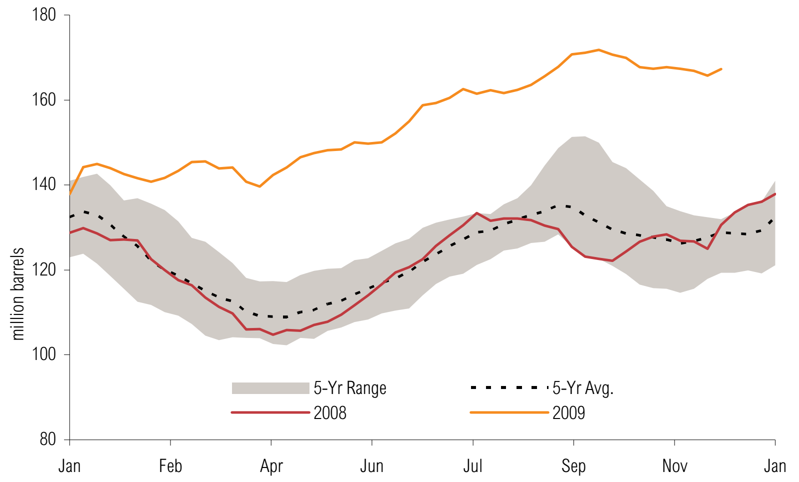
Source: EIA, RBS Sempra

Distillate stocks remain stubbornly high



Source: EIA, RBS Sempra

US distillate stocks remain stubbornly high



Source: EIA, RBS

The refining system is beginning to respond to the slow recovery of demand and the inventory problem. However, it is highly unlikely the distillate inventory glut will be solved before the end of 1Q 2010, and that will remain a limiting weight on the crude oil market for the first half of 2010.

Contangos will continue

The current spread between C1 and C12 stands at about US$8.50/bbl, or approximately 12% of flat price. The extent of the contango, while high, pales in comparison to historical extremes. In particular, the current annual spread as a percentage of flat price is 45 percentage points lower than the maximum level reached earlier this year. So, while current contangos in the oil market look extreme, they are not atypical.

The contangos in crude are driven by high petroleum stocks everywhere around the globe, but in particular by continued high levels of stocks in Cushing, Oklahoma, the delivery point for NYMEX WTI. This geographic point continues to be very well supplied with crude, and stocks have remained close to peak levels all year long. On top of the high onshore stock situation, there is the floating storage problem. Until both floating and onshore stocks draw meaningfully, we believe the market will remain in a strong contango.

Summary of WTI curve structure

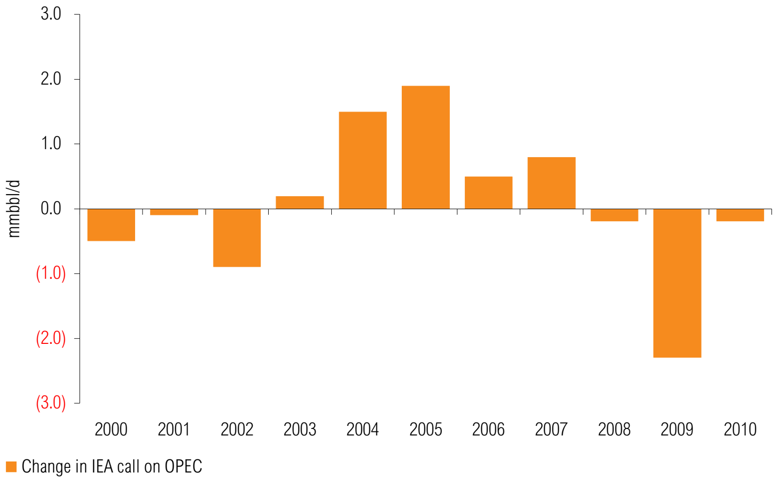
From	To	Duration (months)	Structure	Max annual spread (US$)	Average annual spared (US$)	Max annual spread/flat price (%)	Average annual spread/flat price (%)
Periods of backwardation							
Jan-95	Mar-97	27	Backward	7.11	2.25	29	10
Mar-99	Sep-01	32	Backward	9.45	3.60	28	13
Mar-02	Nov-04	22	Backward	10.44	4.12	28	12
Jul-07	May-08	11	Backward	9.24	4.35	10	5
Averages		**23**		**9.06**	**3.58**	**24**	**10**
Periods of Contango							
Dec-97	Mar-99	16	Contango	(5.18)	(1.91)	-45	-14
Oct-01	Feb-02	5	Contango	(2.38)	(0.74)	-13	-4
Mar-05	Jul-07	29	Contango	(10.55)	(3.79)	-19	-6
Averages		16.7		(6.04)	(2.15)	-26	-8
Current period							
Jun-08	**Period**	**19**	**Contango**	**(23.70)**	**(7.09)**	**-67**	**-13**

Source: Bloomberg, RBS Sempra

The biggest problem for crude bulls in 2010 is ‘Call on OPEC’

At the end of the day the world’s supply – demand balance for crude boils down to a single line: **Call on OPEC’**. This is the amount of oil the OPEC oligopoly has to produce to balance supply and demand. When OPEC produces above the Call on OPEC, inventories rise, and when OPEC restrains volumes below the Call on OPEC, inventories shrink. The central element of the crude oil market’s run to US$147 per barrel in 2008 was the belief that OPEC had run out of spare capacity and future increases in the ‘Call on OPEC’ would exceed OPEC’s ability to produce more crude.

Annual year-on-year change in IEA call OPEC crude production – call on OPEC crude down sharply in 2009



Source: IEA

The demand shock of 2009, has dramatically decreased the Call on OPEC. But perhaps most importantly, looking forward it appears probable that the Call on OPEC **will decline further in H1 10, not increase.** And we believe that a decreasing call on OPEC is likely to prevent prompt crude prices moving significantly above US$80 per barrel in H1 10.

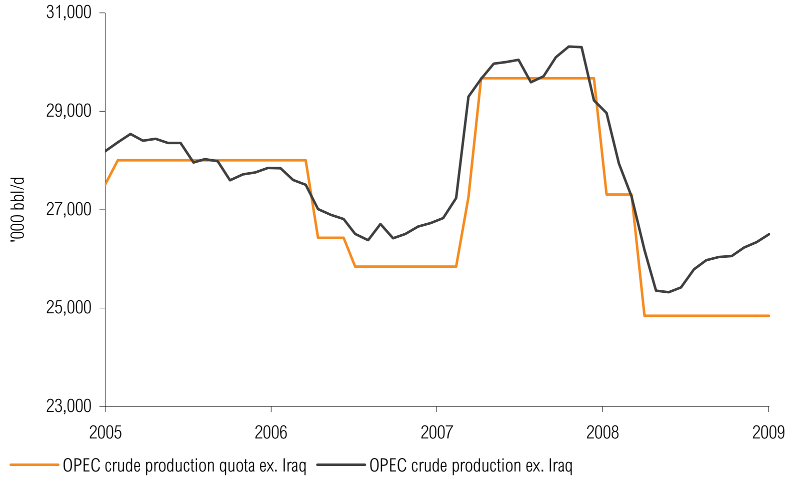
2009 was a year in which OPEC earned its pay, the cartel held together and created a physical market just supportive enough to allow prices to recover despite the largest shock to real demand since the early 1980s. OPEC sends the market signals though… and when absolutely necessary, through real volume changes. OPEC’s jawboning of the market has clearly moved from bullish to neutral:

- **5 January:** Saudi Aramco raised the official selling prices for heavy crude grades. BULLISH
- **10 March:** Saudi Aramco announced it will reduce crude supplies to Japan in April. BULLISH
- **5 June**: OPEC’s El-Badri sees oil US$70-75 a barrel by year end. BULLISH
- **10 June:** “OPEC will only consider increasing its oil production when the price of crude rises above US$100 a barrel” – Kuwaiti Oil Minister Ahmad Al-Abdullah. BULLISH
- **10 June:** Saudi Arabia has started crude production from its Khurais oilfield. BEARISH

- **11 October:** Kuwaiti Oil Minister Ahmad Al-Abdullah described current oil prices as “reasonable”. He also said that “prices that range between US$60 and US$80 per barrel [which] suit both producers and consumers.” NEUTRAL

- **7 December:** “Why should they raise output? We still have time,” Naimi replied. “It depends.... Right now, we see the price is okay between US$70/b and US$80/b. It is close to the target we said. It’s almost US$75/b,” Naimi said. NEUTRAL.

OPEC is loosening their production against their quota



Source: IEA

While the trend in 2009 looks like one of increased ‘cheating’, this is actually increased cheating to serve rebounding demand. We would expect this cheating to continue to increase through the fourth quarter of 2009. OPEC will likely increase its quota to meet the actual level of production nearer to 2010.

In its December Oil Market Report, the **IEA revised up** its Call on OPEC for 2010 by about 0.5 mmbbl/d. This was mainly due to the IEA revising down 2010 OECD supply by roughly 0.4 mmbbl/d while revising global demand up by some 0.1 mmbbl/d to 86.3 mmbbl/d for 2010.

IEA global crude oil supply/demand balance… demand now seen at 2005 levels and falling

	2006	2007	2008	2009e	2010e	1Q09	2Q09	3Q09	4Q09E	1Q10E	2Q10E	3Q10E	4Q10E
Demand													
OECD	49.5	49.2	47.6	45.5	45.5	46.6	44.4	45.1	46.0	46.2	44.5	45.3	46.1
Non-OECD	35.7	37.3	38.7	39.3	40.8	37.9	39.7	40.3	39.5	39.5	39.9	41.4	40.8
Global Demand	**85.3**	**86.5**	**86.3**	**84.9**	**86.3**	**84.5**	**84.1**	**85.3**	**85.5**	**86.1**	**85.6**	**86.7**	**86.8**
Supply													
OECD	20.1	19.9	19.3	19.2	18.6	19.7	19.0	19.0	19.2	19.2	18.6	18.1	18.7
Non-OECD	28.0	28.5	28.7	29.3	30.3	29.0	29.2	29.4	29.7	30.1	30.3	30.2	30.6
Processing Gains	2.1	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2
Other biofuels	0.2	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5
TOTAL NON-OPEC	**50.4**	**50.8**	**50.6**	**51.3**	**51.6**	**51.3**	**50.9**	**51.2**	**51.7**	**52.0**	**51.6**	**51.1**	**52.0**
NGLs	4.4	4.5	4.7	4.9	5.7	4.6	4.7	5.0	5.2	5.4	5.6	5.9	6.0
Call on OPEC crude	**30.6**	**31.3**	**31.0**	**28.7**	**29.0**	**28.6**	**28.5**	**29.1**	**28.7**	**28.7**	**28.5**	**29.8**	**28.9**
OPEC crude capacity	34.9	35.7	37.3	38.6	39.7	38.6	38.6	38.6	38.6	39.7	39.7	39.7	39.7
OPEC spare capacity	4.3	4.4	6.3	9.9	10.7	10.0	10.1	9.5	9.9	11.0	11.2	9.9	10.8

Source: International Energy Agency, OPEC, RBS Sempra forecasts

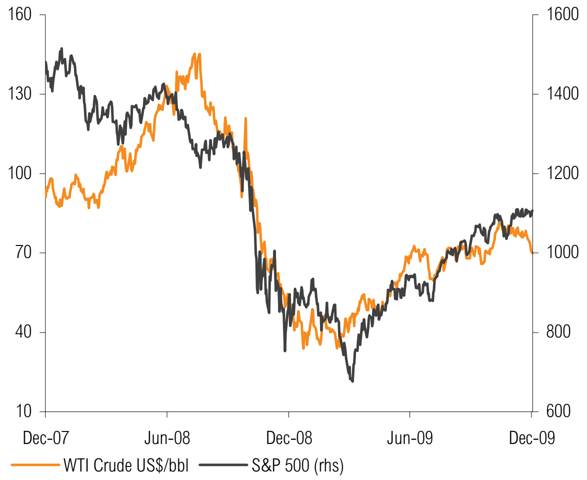
Someday this market is going to end: Oil, the US dollar and equities

If there is one thing we have to continually remind ourselves of in this market is that price today is not about oilfields, tankers and inventories. It is about dollars and equities. In the short term, at a minimum, this is a market driven by macroeconomics.

We would like to show how the oil market traded over a single day as an illustration of how today's oil market works. On Friday, 4 December, the oil market opened morning trade at 8am EST at just under US$76/bbl. The oil market still considers the 09:00 open outcry the 'official' opening of the crude market but electronic trading is so dominant now that it is quite sufficient to say "when all the traders in New York show up at their desks in the morning" as the real open. Friday, the 4th, was an important day as it also saw the monthly jobs report, perhaps the most important piece of monthly economic news gauging the US recovery from recession. This particular Friday, the unemployment report was a pleasant surprise, with unemployment falling instead of rising, as reported at 8:30AM EST.

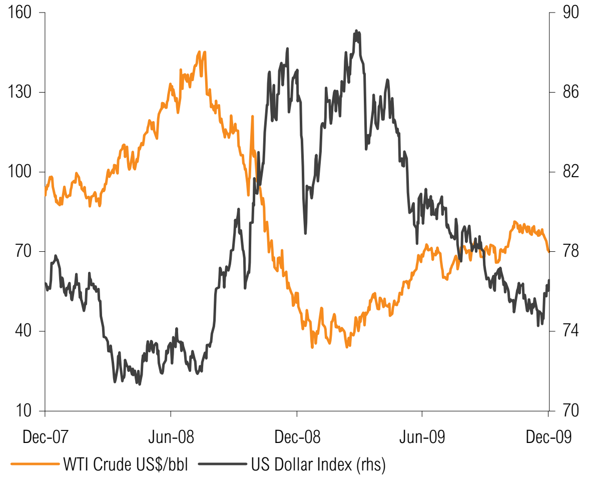
The crude oil market and the S&P 500 immediately rallied. For the oil market, this makes perfect sense, more people working means more driving and more industrial activity and thus more crude demand. However, by 10:00AM, a weakening S&P 500 was pulling crude down with it, and they traded in tandem for the rest of the day, leading crude to breach US$75/bbl by the end of the day. That day, the S&P 500 changed by 0.55% and the price of crude changed by 1.29%.

S&P 500 vs WTI crude oil – 2010 is a good time for the oil market to grow up and determine its own destiny



Source: Bloomberg, RBS

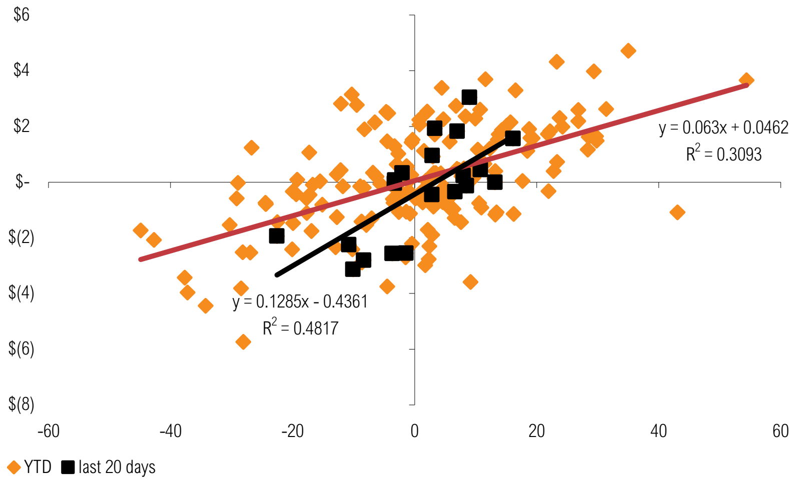
The trade weighted US dollar index vs WTI crude oil



Source: Bloomberg, RBS

The following scatter plot shows the price of WTI in the past year against the price of the S&P 500. They trade in the same direction 67.5% of the time, but most notably, you do not see extreme strength in WTI at the same time as you see extreme weakness in the S&P.

Large moves in equities are mostly matched by large moves in crude



Source: IEA

While this is really just a question of taste, we do not particularly regard this relationship between crude and the S&P as healthy. In fact, when you look at the history of correlation between crude and equities, they have never traded this correlated for this long.

We believe this is a relationship which should break down in 2010; as a move in oil prices from US$80 to US$100 is likely to be regarded as more harmful than say a move in oil from US$60 to US$80 per barrel.

Price outlook

The inventory overhang, both floating and onshore will weigh on the front of the oil market well into 2010. We believe that will keep prompt prices in the US$70-80 range in H1 10. Lower than US$70 risks OPEC action and higher than US$80 barrel requires an increased Call on OPEC. Longer term, a recovering global economy and developing world demand will likely drive an increased Call on OPEC, and higher prices would be required to keep non-OPEC producers aggressively seeking new sources of supply.

RBS oil price forecasts

		2006A	2007A	2008A	2009F	2010F	2011F	2012F	2013F
WTI	US$/bbl	66.25	72.36	99.75	61	82	85	90	100
	% chg yoy		9%	38%	-39%	34%	4%	6%	11%
Brent	US$/bbl	66.13	72.66	98.52	63	80	86	91	101
	% chg yoy		10%	36%	-37%	27%	8%	6%	11%
		Q1 09A	**Q2 09A**	**Q3 09A**	**Q4 09F**	**Q1 10F**	**Q2 10F**	**Q3 10F**	**Q4 10F**
WTI	US$/bbl	43	60	68	74	78	80	85	85
	% chg qoq		38%	14%	8%	5%	3%	6%	0%
Brent	US$/bbl	46	60	69	76	79	79	81	81
	% chg qoq		31%	15%	10%	4%	0%	3%	0%

Source: NYMEX, ICE, RBS

US Natural Gas

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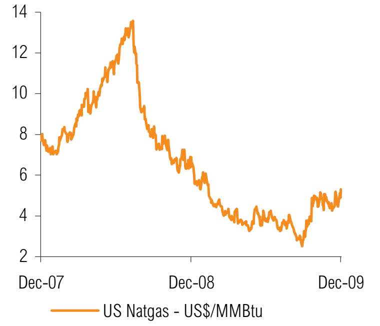
Shale gas and the US bear market

While prompt natural gas prices put in a major low in September of 2009, at US$2.50/MMBtu the market has hardly been bullish since. Forward contracts have remained under relentless bearish pressure. We have written all year about the technology shock in the US natural gas market, and its impact has not played out yet. To the left, we present the prompt US natural gas price, which has put in a dramatic bottom, but in this section we consider the 2010 'strip' price of natural gas that argues that we may not have seen the bottom yet.

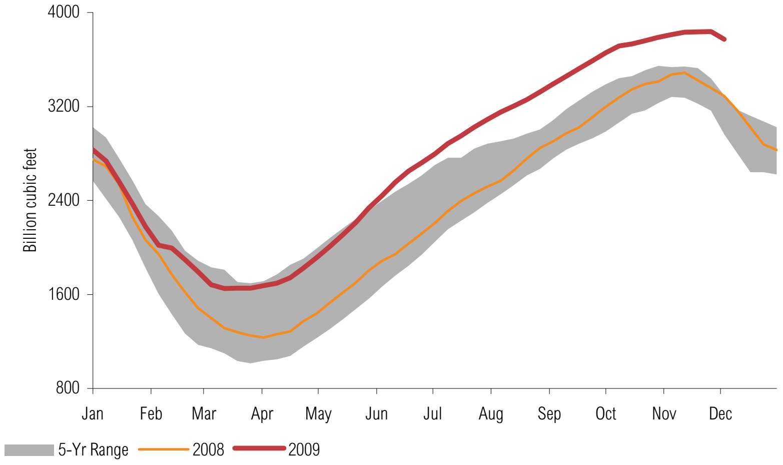
Prompt US natural gas looks to have seen its low, at last



Source: Bloomberg, RBS

Low spot prices in 2009 have been a reflection of swollen US gas inventories (shown below). This summer US prices had to go to levels that led to coal plants turning off and burning natural gas in the power stack instead. Prices had to force drillers to lay down their rigs to slow down the pace of production gains. The natural gas market in 2010 will be trying to answer this question: how far and how fast does this shale technology phenomenon go? In that sense, current forward pricing reflects a debate about this technology.

US natural gas inventories still at record levels



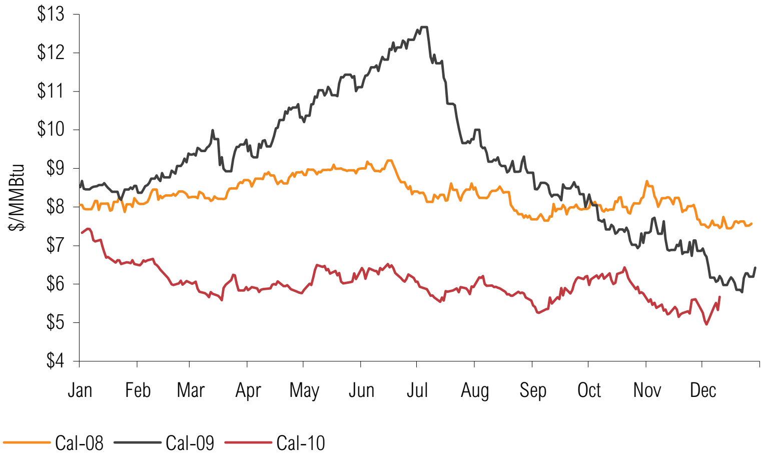
Source: EIA

The production debate

The problem for the US exploration and production industry is that the exciting results of the gas shales seem to be replicable in many areas and replicable over time. What was chiefly an inventory story in 2009 is increasingly a cost of production story looking forward. And the better the results sound coming from the shale plays, the more the market is pricing that new technology into forward prices.

The following chart shows the 2010 forward strip compared to how the forward one-year strip was priced in previous years. So, for example, how was 2009 priced in 2008, how was 2008 priced in 2007, etc.

Historical trading in NG calendar-year average strips



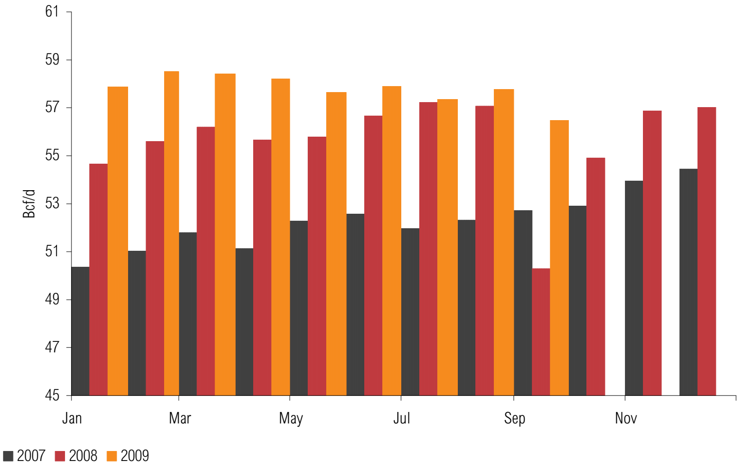
Source: Bloomberg, RBS Sempra

What the chart shows is that the bear market of 2009 is not just in spot prices but also has extended well into pricing of 2010 contracts. The natural gas market in 2010 will be trying to answer this question: how far and how fast does this shale technology phenomenon go? In that sense, current forward pricing reflects a debate about this technology.

How the bears see it

The bears in the US market are technology optimists, and they are driven by a belief that shale technology has changed the game. Comments coming out of shale gas operators make the bearish case even at today's prices a very seductive argument. Apache recently called the emergence of the shale plays "an undeveloped 'sea of gas'." Chesapeake has posited that shale gas means they "will continue delivering low-cost predictable growth for years to come." Southwest Energy is talking about efficiencies in drilling where well average initial production rates have climbed from 1,261 Mcf/day in 1Q 2007 to 3,604 Mcf/day in 3Q 2009 (an 185% improvement). Across the US E&P world, wells are being drilled faster and producing more volumes.

US natural gas production: Still very strong yoy



Source: Baker Hughs, RBS Sempra

This technology shock has driven record production volumes. EIA's Form 914 data has remained stubbornly high long after prices fell below $5.00/MMBtu in February 2009.

How the bulls see it

In assessing the impact of a technology shock on an industry, it is important to remember that technology takes time and capital in order to propagate. Just because a new technology exists, doesn't mean its adoption is instantaneous — *except for Apple iPods*. In the US gas business, clearly horizontal drilling of shale wells is a big deal. The Barnett Shale is already a 4 Bcf/day play, the Fayetteville Shale is a 1 Bcf/day play, the Haynesville is ramping up towards 1 Bcf/day and the Haynesville will likely be a >1 Bcf/day play by the end of 2010. These are big numbers. But there is the little problem of a US production base which is roughly 62 Bcf/day. Even if half of US domestic production is unconventional, at least 50% is still conventional production that will see little minimum investment at sub US$6.00/MMBtu. And plummeting rig counts attest to this lack of investment in the space.

We take a probabilistic view on production

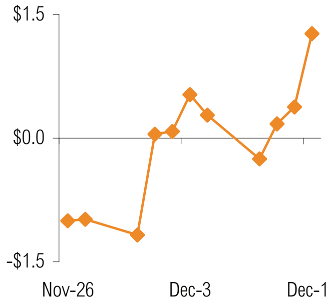
Our take on the production story is that while the technology shock from horizontal shale production is very important, the probability is that at some point low prices and low rigs lead to US domestic production disappointing. Certainly, we have seen that in Canada, where field receipts on the TransCanada Alberta system are currently running at roughly 9.34 Bcf/day, a 9% decline from a year ago. A 9% decline in supply is a good proxy for the risk the conventional side of US gas production economy is facing.

In the near term, the shales appear to be at full speed ahead as rigs are shifted from the established Barnett to the very exciting Haynesville, Eagle Ford and Marcellus shales. But we believe followers of the US gas market should be prepared for the possibility that sometime in 2010, conventional supply declines are not fully offset by growth from the shales. There is plenty of uncertainty here; the shale technology shock really may be so big that it overwhelms conventional supply decline. However, we believe the risk is that an underlying decline in conventional will lead to smaller US production numbers, and that will begin to tighten US inventories in 2010.

LNG and the European bear market

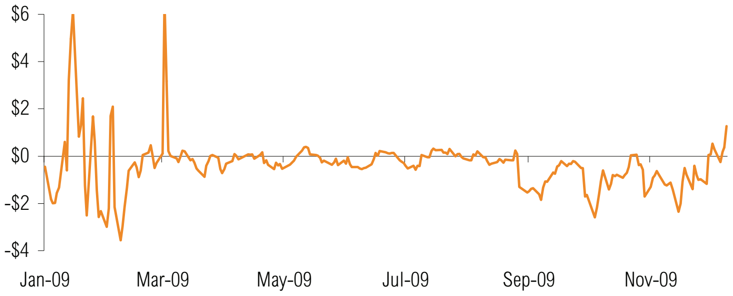
For navel-gazing North American markets, a quick glance at European markets (we use the NBP in the UK as the proxy) presents a surprise: prompt prices in the UK are even cheaper than the US. We use an East Coast US location, Transco Z6, non-New York as a proxy for the price many LNG terminals on the East Coast can receive for their gas:

Transco Zone 6 minus UK NBP



Source: RBS Sempra

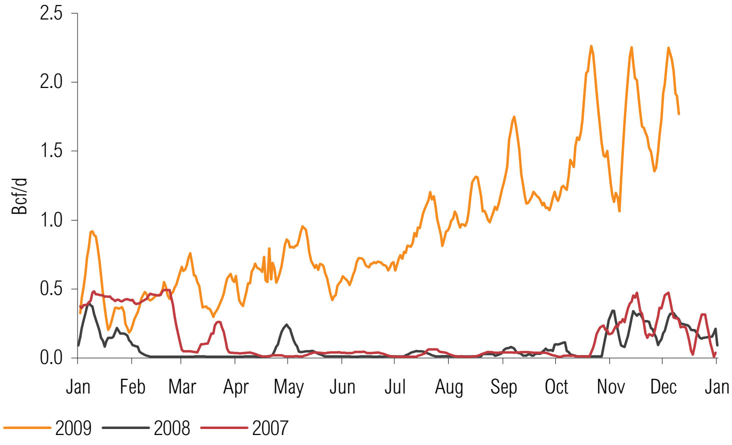
Transco Zone 6 minus UK NBP: A rare US premium price



Source: RBS Sempra

This is actually a rather shocking turn of events, as North American markets assume that Europe will always find a way to outbid the US for gas. If the US market can point to shale gas (and weak demand), the European market can point to LNG (and weak demand), which has targeted Europe in a big way as supply has ramped up in 2009. Consider below a chart showing sendout of LNG onto the UK NBP system.

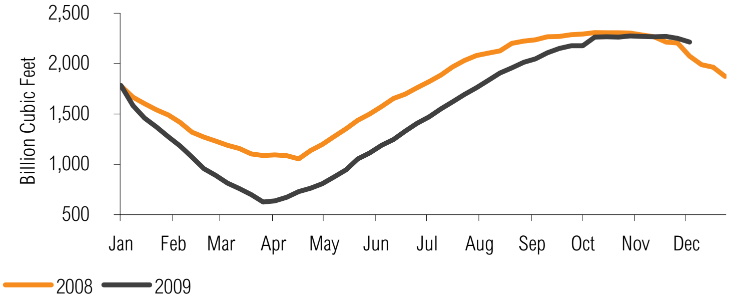
UK LNG sendout



Source: RBS Sempra

This publication is the wrong place to break down the LNG supply-demand balance and outlook; however, there will be a dramatic surge of new LNG supply coming on the global market in the next six months. Flows of LNG from new and re-starting liquefaction terminals at Snohvit, Nigeria LNG, Sakhalin, Tangguh 1 and 2, Yemen LNG and QatarGas II Train 5 will all need to find consumers for their gas. **The global gas market needs to absorb a nearly 20% increase in supply in the next four to six months**. This will be a challenge as stocks are high not just in the US (see above) but in Europe as well.

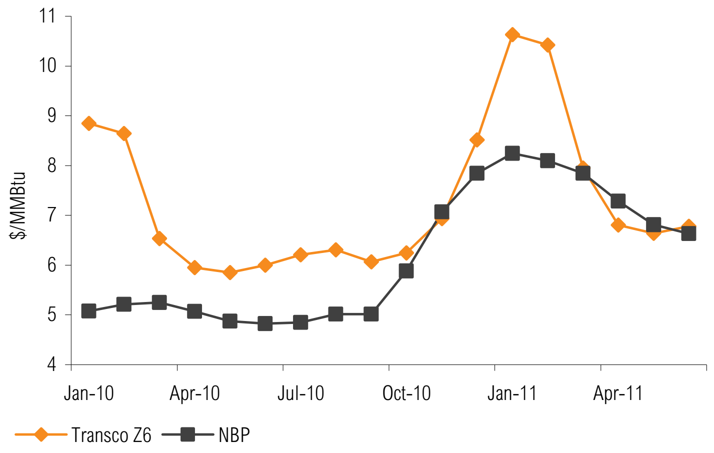
European storage has refilled



Source: RBS Sempra

2010 is shaping up to be a year in which both the US and Europe are struggling with surplus inventories, and there is a highly flexible swing source of supply (LNG) that is growing and will seek the highest price. This is actually a very exciting moment in global gas market history: 2010 will be the year in which the law of one price comes into global gas markets and the global gas market begins to look a lot more like the global oil market than it does the gas market.

UK and US forward strips



Source: RBS Sempra

Price outlook

The next few years will be a radically less volatile environment for gas prices, both US and globally than the past few. Gas prices in the US face considerable headwinds: In 2009 US gas demand was a significant beneficiary of demand from a loafing coal sector. Between a price of $4.25 and $4.75 coal begins to look more attractive than gas in the power stack, and so spot prices of $4.75 and above should see US gas lose 2-4% of its demand. Shale technology has obviously changed US marginal cost, and with very dramatic reserve bases, it is increasingly likely that forward prices above $7.50/MMBtu will strongly incentivize a production response. Finally LNG is ramping up quite dramatically in 2010 and price rallies that bring US East Coast prices significantly above the UK are likely to attract a significant amount of LNG supply. These are powerful forces that will limit the upside of any rally.

On the downside, forward prices significantly below $6.00/MMBtu are clearly putting all conventional production in the US at risk of coming to a complete halt. As long as there is a big fat inventory surplus on hand, the gas market is willing to test the resolve of the conventional gas business to stop development. But when that inventory overhang is worked down, it is unlikely the gas market will tolerate forward prices far below $6.00. We believe US storage is on a track to slowly eliminate its storage overhang in 2010, and that will create firmer prompt pricing in natural gas. Our price curve remains unchanged from our October Commodity Companion.

RBS Henry Hub natural gas price forecasts

		2006A	2007A	2008A	2009F	2010F	2011F	2012F	2013F
H-Hub nat gas	US$MMBtu	6.98	7.12	8.90	4.25	6.25	6.50	6.75	7.00
	% chg yoy		2%	25%	-53%	48%	4%	4%	4%
		Q109A	**Q209A**	**Q309A**	**Q4 09F**	**Q110F**	**Q210F**	**Q310F**	**Q4 10F**
H-Hub nat gas	US$MMBtu	4.47	3.81	3.44	5.25	5.75	6.25	6.50	6.50
	% chg qoq		-15%	-11%	55%	10%	9%	4%	0%

Source: Bloomberg, RBSSempra

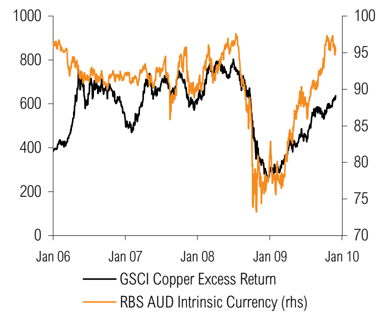
Commodity and FX relationships

Quant analytics provided by Toby Wade and Theodore Chen – RBS Quant Analytics

Introduction

We know that there is a link between commodity prices and the US dollar. Even more, we know that there are links between commodity prices and commodity currencies. We can now take this further by identifying which market tends to lead, lag or if at all. It may come as a surprise to you, but our analysis finds that lags in FX tend to cause (predict) commodity prices.

Copper versus the AUD



Source: LME

We test lead-lag relationships using a known econometric technique called Granger Causality (GC). So, for example, we know there are periods where a move in the Australian dollar tends to predict copper prices. We note that this particular relationship began very clearly from January 2006 onwards.

The GC concept can be very powerful. The method entails **identifying statistical significance for one-way lead-lag relationships**. Specifically, if exchange rate lag causes commodity prices today and not vice a versa, then GC exists for exchange rate causing commodity prices. In addition, GC will not exist if both commodity prices and exchange rate cause one another or if both are not statistically significant. The key is to find a clear one-way directional relationship. For example, we found that AUD/USD and copper prices have no clear directional relationship, so it is difficult to use either one as a leading indicator for the other. However, this can be overcome by using the RBS Intrinsic Currency Model.

RBS Intrinsic Currency Model

The RBS Intrinsic Currency Model is a statistical model for estimating the value of a currency in its own right. Traditionally, the market convention uses Trade-Weighted Indices (TWI) produced by the Bank of England for example. The RBS Intrinsic Currency Model is a quantitative alternative to this qualitative approach. Problems with qualitative approaches are that they are not consistent with rates observed within the market. The RBS Intrinsic Currency Model provides individual currency values that are fully consistent with the spot FX market, and reflects the intuitive correlation structure that exists between the underlying economies. With this approach, one can attribute for a currency pair how much of percent increase/decrease is due to the individual currency. For example, the GBP/USD falls by 2% over one day, how much is due to GBP and how much is due to the USD?

As a result of the Granger Causality in-sample testing from Jan-99 to Dec-04 and associated each commodity with a top three importing, exporting, producing and/or consuming country, the below table summarises the testing results on a monthly basis. For example, Australian dollars (AUD), Chilean peso (CLP), and US dollars can be used to predict copper prices.

RBS Intrinsic Currencies that have statistically significant leading relationships by metal on a monthly basis (i.e., which intrinsic currencies cause metal prices)

Metal	Statistically significant	Statistically insignificant
Gold	AUD	ZAR, PEN
Silver	PEN, CNY	AUD, MXP
Copper	AUD, CLP, USD	NZD, TWD
Aluminium	RUB, CAD	CNY, JPY
Nickel	CAD, Silver	RUB, AUD
Zinc	CNY, PEN, AUD, Silver	
Lead	AUD, PEN	KRW

Source: RBS

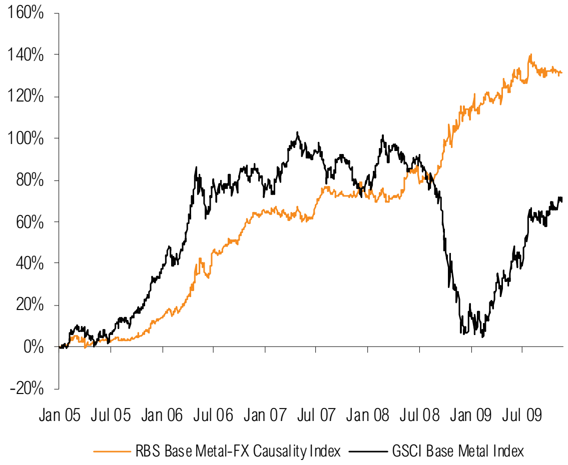
Why is the relationship this way round?

The conventional market wisdom is that commodities on a fundamental level clearly influence currency rates, relating to costs of production. However, the currency markets are more liquid, and are **increasingly used by speculators to take macro views as proxies of other asset classes**. In addition, currencies tend to be more forward looking than commodities. Therefore, we are able to utilise the FX information to predict commodity prices. Indeed, recent academic research[1] points to this very phenomenon.

Alpha models for metals

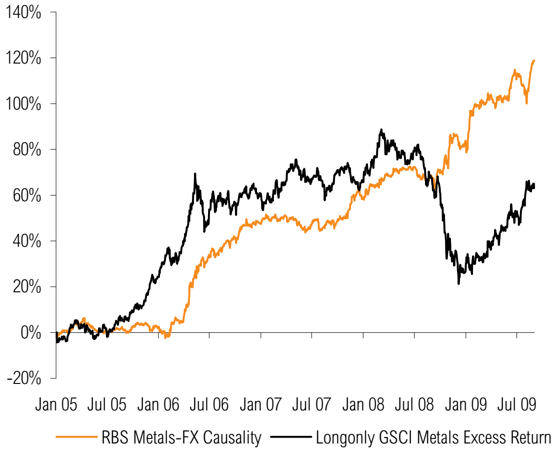
Using the above information, we are able to construct a forecasting alpha model to predict both medium- and short-term metal prices using lag FX values. The medium-term (monthly) model of an equal weighted portfolio of base metals (Al, Cu, Ni, Pb, Zn) provides average annual return of 26.0% over out-of-sample period January 2005-November 2009, after transaction costs and an information ratio of 1.48. For the short-term model, a liquidity based weighted portfolio of base (Al, Cu, Ni, Pb, Zn) and precious (Au, Ag) metals provides average annual returns of approximately 24% over the out-of-sample period, after transaction costs and an information ratio of 1.70. The key highlights of the model are: lower transaction costs; low correlation risk; strong liquidity; high IR; stop-loss mechanism; including an inventory demand/supply overlay; and incorporating forward-looking FX.

Medium-term Base Metals Alpha Model – Medium monthly lead-lag model



Source: Bloomberg, RBS

Short-term Metals Alpha Model – Short-term daily lead-lag model



Source: Bloomberg, RBS

Conclusion

Analysing relationships between markets and asset classes is fertile hunting ground for excess return. There are apparent linkages between currency and commodity markets. Innovation is required to identify meaningful relationships. Marrying together systematic analysis and fundamental market knowledge is beneficial. Care is required to cope with changes in the market structure and drivers.

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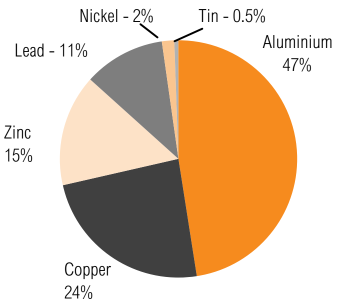
1. *Can Exchange Rates Forecast Commodity Prices?*, Chen, Rogoff, Rossi, Feb 2008

Commodity Companion appendix

Guide to everyday uses for commodities

Aluminium. Aluminium production begins with the mining of bauxite, which is refined to alumina and then converted to aluminium metal. Refined metal, in turn, is used in many consumer sectors such as beverage cans, foil and food packaging, white goods, automobiles, trucks, trains and aircraft, building and construction, and electrical application such as cables.

Base metals global market share by volume, five-year average



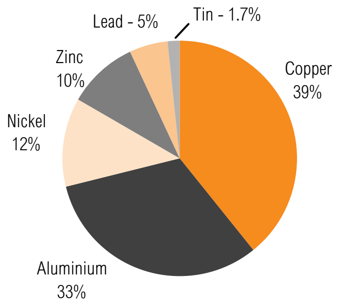
Source: WBMS, ILZSG,

Cobalt. This is a strategic and critical metal used in many diverse industrial and military applications. The largest use of cobalt is in super alloys, which are used to make parts for gas turbine aircraft engines. Cobalt is also used to make magnets; corrosion-resistant and wear-resistant alloys; high-speed steels' cemented carbides and diamond tools; catalysts for the petroleum and chemical industries; drying agents for paints, varnishes and inks; ground coats for porcelain enamels; pigments; battery electrodes; steel-belted radial tyres; and magnetic recording media.

Copper. Copper is used in the electrical industry both as a conductor (wiring and cable) and for electrical equipment. It is also used in the power industry for large-scale electrical transmission. Copper is widely used in tubing for drinking water and in central heating and air-conditioning systems. It is used in the engineering sector, often in the form of an alloy material such as brass and bronze.

Lead. A large proportion of the lead produced is used in the production of automobile and commercial vehicle batteries and for industrial load-levelling uses. Over three quarters of all lead consumed is by lead-acid batteries of one kind or another, mostly in starting, lighting and ignition (SLI) applications. Other uses include cable sheathing, pipe and sheet, chemicals (such as PVC and in glass for lighting and TV tubes) and alloys.

Base metals global market share by value, five-year average



Source: WBMS, ILZSG, LME

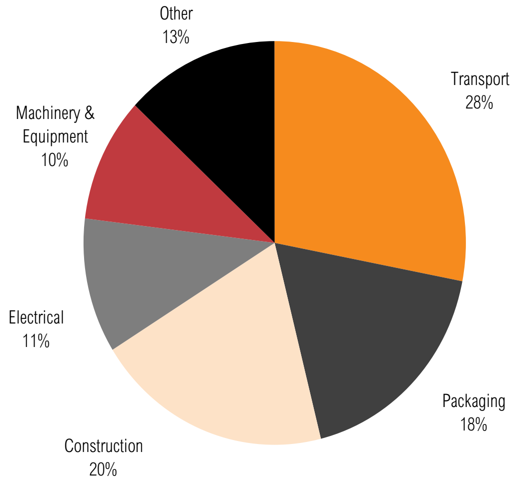
Nickel. Nickel-containing alloys and steels are highly resistant to corrosion and oxidation and provide both strength and toughness at high temperatures. The major use for nickel is in the production of stainless steel, which accounts for more than 65% of total world nickel consumption. Other uses for nickel include rechargeable batteries, alloy steel, nickel alloys, copper alloys, castings, plating and chemicals. Pure nickel metal or nickel alloyed with other metals (normally copper) is also used in coinage.

Tin. By far the largest market for tin is for solders, electrical and electronic, as well as traditional engineering and plumbing. Tin has benefited from the move to lead-free solders. Other uses include tinplate for food and beverage cans, various chemicals including fire retardants, and bronze.

Zinc. There are a number of major markets for zinc consumption. Zinc is used in coatings for protection against iron and steel corrosion, zinc alloys for casting and as an element of alloys such as brass. It is also required in sheet form for roofing and the cladding of buildings, and tyres in the form of zinc oxide.

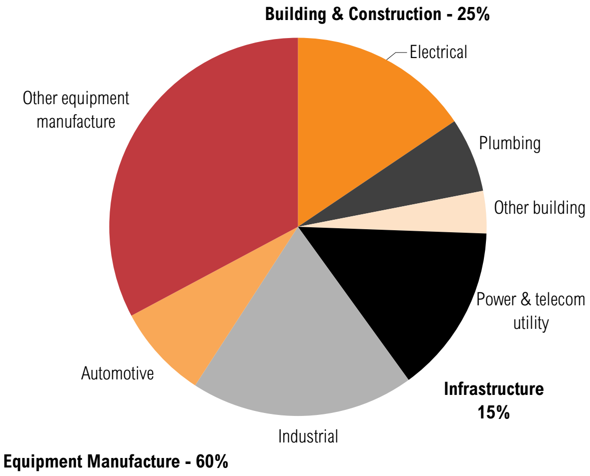
Base metals offtake by key end-use sectors

Aluminium – 2009E global consumption = 34.50mt



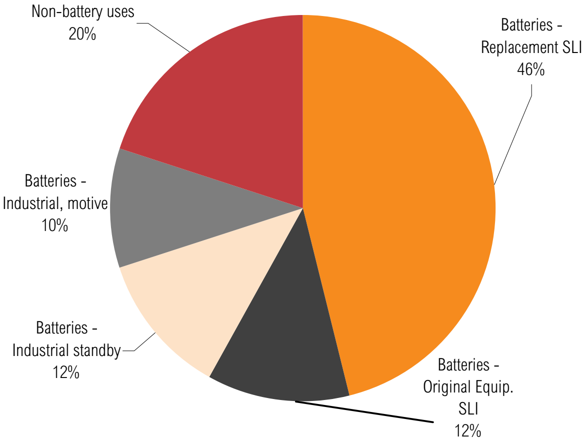
Source: CRU

Copper – 2009E global consumption = 16.65mt



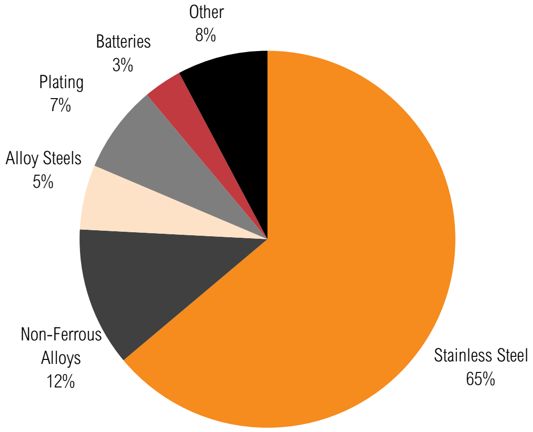
Source: ICSG

Lead – 2009E global consumption = 8.25mt



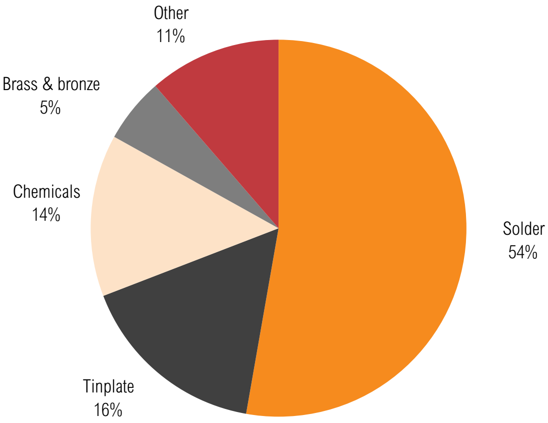
Source: Brook Hunt

Nickel – 2009E global consumption = 1.24mt



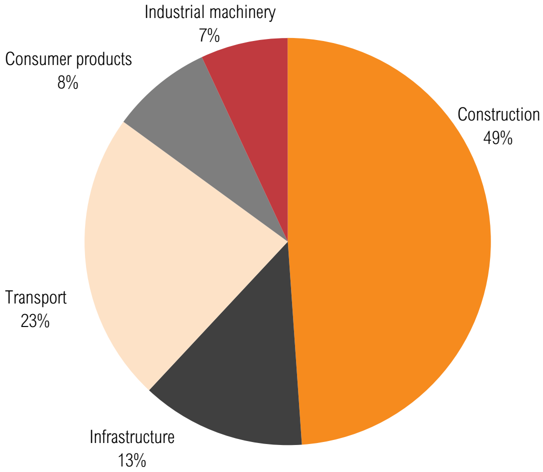
Source: CRU

Tin – 2009E global consumption = 0.31mt



Source: ITRI

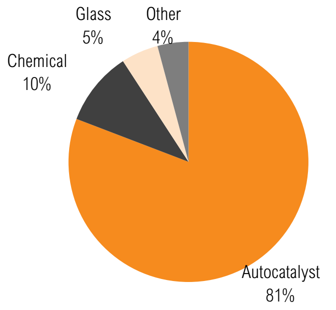
Zinc – 2009E global consumption = 10.25mt



Source: Brook Hunt

Precious metals offtake by key end-use sectors

Rhodium – 2008 global consumption = 21t



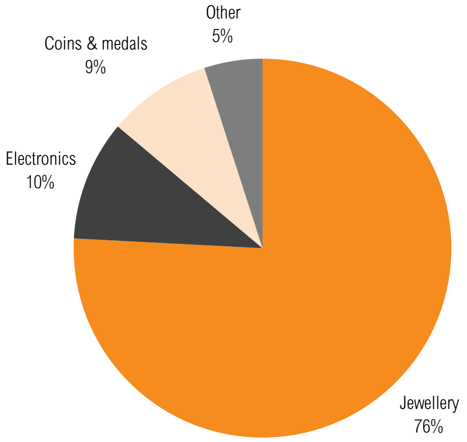
Source: Johnson Matthey

Gold. Historically, governments used gold to back and underpin their currencies. Central banks do, however, still hold substantial reserves of gold totalling nearly 30,000 tonnes and worth around US$830bn. Gold is mostly used in the jewellery sector (serving large markets such as India and China), with other uses in the electronics industry, dentistry, coinage/medals sectors and decorative industries. Gold is also used as a safe haven and portfolio diversifier by financial institutions, with a range of listed physically backed ETFs.

Silver. There are some primary silver mines, but silver tends to be extracted as a by-product from lead-zinc, copper or gold mining. Its end uses include photography, jewellery and silverware, and industrial and decorative products.

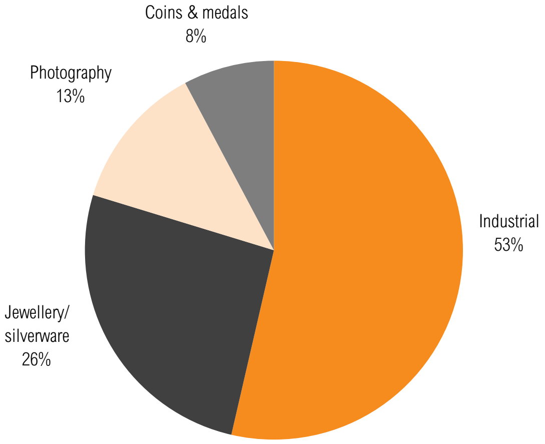
Platinum Group Metals (PGMs). Platinum, palladium and rhodium are used in the automotive industry for the production of vehicle exhaust emission-cleaning auto-catalysts. Palladium is favoured for gasoline engine vehicles and platinum for diesel. Jewellery also accounts for a sizeable proportion of platinum and palladium offtake. Other uses include dentistry, electricals, chemical and electrochemical industries and investment (coinage/medals).

Gold – 2008 global metal fabrication = 2,850t



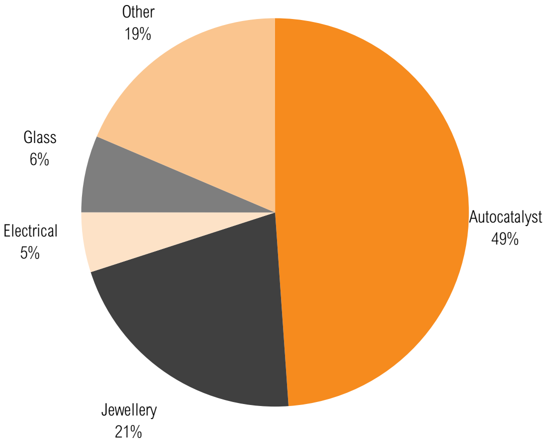
Source: GFMS Gold Survey – 2009

Silver – 2008 global metal fabrication = 25,896t



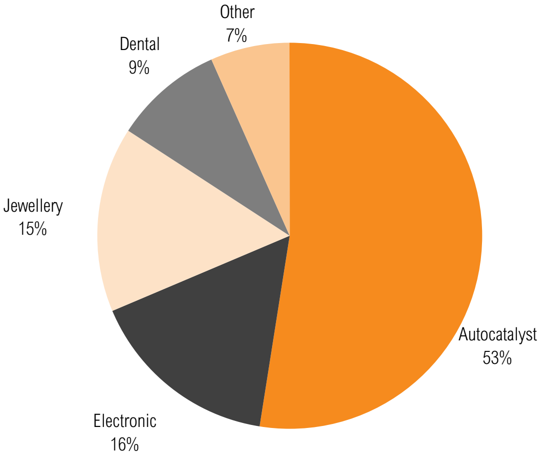
Source: GFMS Silver Survey – 2009

Platinum – 2008 global consumption = 242t



Source: GFMS Platinum & Palladium Survey 2009

Palladium – 2008 global consumption = 261t



Source: GFMS Platinum & Palladium Survey 2009

A simple guide to commodity indices

Indices are designed to be a benchmark for the performance of the commodity sector as a whole or for a particular sub-sector of the market. Returns are based on a weighted basket of underlying commodity futures, with positions usually taken in the front month contracts due to greater liquidity. However, differing indices use differing methodologies that may have an impact on performance.

Key commodity index components

Returns to commodity investors comprise three components. The first is the absolute price performance of the underlying futures contracts of the index components. This is referred to as the **spot index** performance and is a useful indicator of spot price trends and momentum in the commodity markets. Analysing the spot index performance of sub-indices of the major commodity indices (S&P GSCI, DJ-AIG and R/J CRB) is useful in identifying the leading and lagging sectors within the commodity markets.

The **excess return index** is a combination of changes in the spot index and the accumulated roll yield since inception of the index. As each front month future approaches expiry, it needs to be 'rolled' into the next nearby contract on a pre-determined day of the month to maintain exposure to changes in the underlying commodity future. This would involve, for example, selling the maturing June contract and purchasing an equivalent position in the July contract. The roll yield is the difference between the price at which the front month future is sold and the second future is bought.

Whether the roll yield is positive or negative will depend upon the shape of the forward curve. A downward sloping or 'backwardated' forward curve will lead to a positive roll yield, as shown in the next chart. Conversely, if the forward curve is upward sloping or in 'contango', the return from rolling will be negative. The angle of the front end of the forward curve will determine the size of the roll yield.

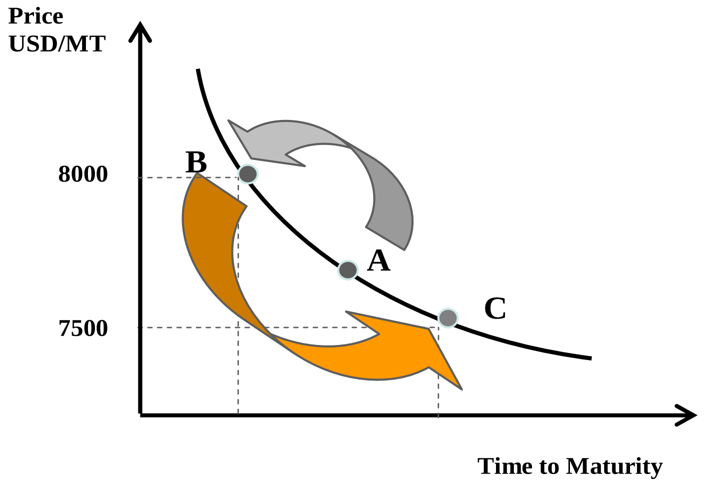
1. Investor holds the first nearby futures contract (point A)

2. As the contract approaches maturity, it rolls up the curve, appreciating in price

3. Immediately prior to expiry, the front month contract is sold (point B) and the next nearby contract bought (point C)

4. Positive roll yield of US$500 is generated by the margin between the prices at which the two futures contracts are bought and sold

Example of how a backwardated forward curve generates a positive roll yield



Source: RBS

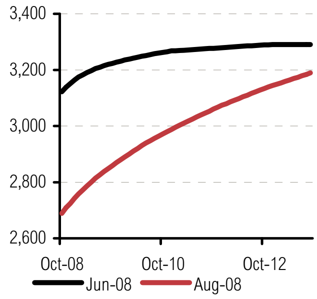
The **total return** assumes a fully collateralised investment is made up of the excess return plus a return on collateral at a risk-free rate, generally the US Treasury bill return. Should the price of the basket of commodities decline in between roll periods, the collateral put up by an investor in a fully collateralised index product will be consumed in margin payments for the basket of futures contracts, reducing the accrued interest and resulting total return.

Generally, investment can be made in both the excess return and total return indices. The spot index is usually more theoretical, as exposure to underlying commodities cannot be achieved without taking out futures contracts and therefore being exposed to positive or negative roll yields. However, spot indices provide a good benchmark for tracking price trends in differing commodity sub-sectors and comparing commodities with other asset classes, as it removes bias from positive and negative roll yields.

Commodity forward curves – contango and backwardation

Commodity forward curves are a representation of where the market is pricing an underlying asset for delivery at a given date in the future. The curve is the construct of a set of individual exchange-traded forward contracts, often at monthly intervals.

LME aluminium forward curve in contango (US$/t)



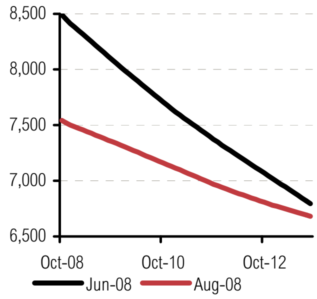
Source: LME

As most trading occurs in nearby futures contracts, the front end of the curve is increasingly influenced by speculative investor flows. The back end of the curve is usually far more stable in commodity markets, driven by more predictable producer hedging activity, acting as a pivot while flows at the front end determine the slope and curvature.

A **contango** market is a situation where the nearby price is lower than the forward price, reflecting the time value of money and the cost of carrying the physical material.

Backwardation is a situation where the nearby price is higher than the forward price; this may reflect a situation of short-term supply tightness inflating the nearby price.

LME copper forward curve in backwardation (US$/t)



Source: LME

Reweighting, rebalancing and the rolling of contracts

The various commodity indices have different methodologies used in the calculation of index returns and resulting returns to investors. It is important to identify some key terms that are used in distinguishing between these different methodologies.

Index reweighting is the process in which the target weights of individual components within the index are reviewed. This may include the number of commodities, the individual futures contracts and the target weighting that each futures contract will have. The criterion used to determine the weighting of components within the index tends to be focused around the relative value of components or the liquidity of futures contracts.

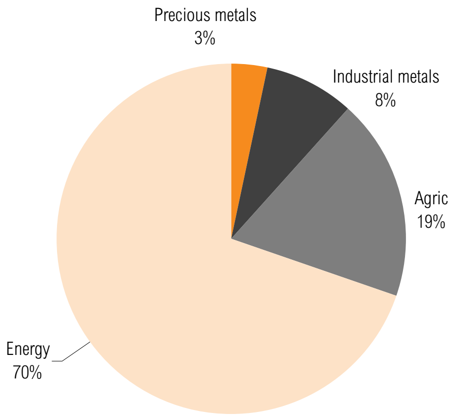
Index rebalancing is when the individual components of an index are reset to their target weights. When an index is rebalanced, components that have outperformed will have their weighting reduced, and those that have underperformed will have their weighting increased.

Rolling contracts: the regularity of rolling and the position on the forward curve when a contract is rolled will have an impact on the index roll yield. The more regularly contracts are rolled, the more accentuated the positive or negative yield will be. Therefore, indices dominated by components that are in backwardation will benefit from more regular rolling of contracts.

Commodity index weightings by sector and contract

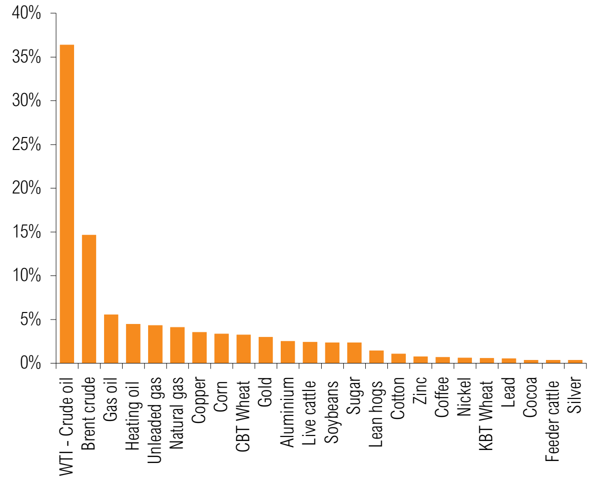
S&P Goldman Sachs Commodity Index – (S&P GSCI)

S&P GSCI index weighting by sector



Source: Bloomberg, RBS

S&P GSCI index weighting by contract



Source: Bloomberg, RBS

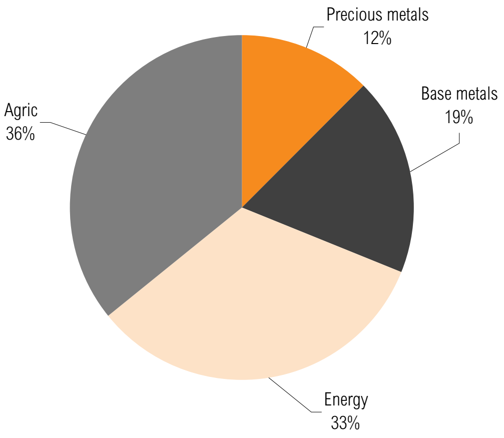
Determining weighting

The S&P GSCI is primarily weighted on a world production basis. Weightings are reviewed relative to the value of individual components calculated using an average quantity of production and market value, as per the last five years of available data. Revisions to the index's component weightings become effective in January.

The GSCI is **rebalanced annually**, in early January, and contracts are **rolled on a monthly basis**.

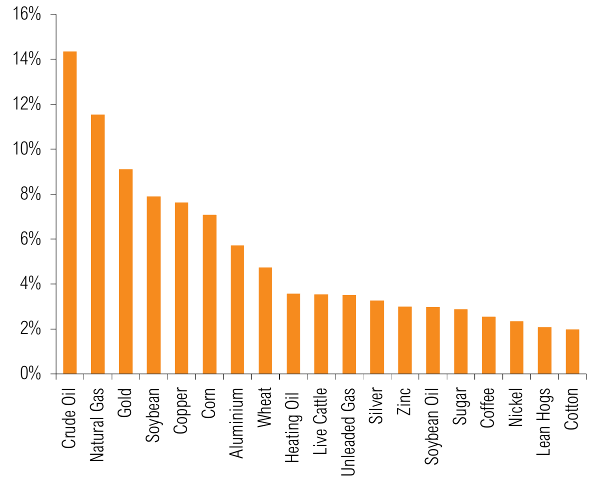
Dow Jones – UBS Commodity Index – (DJ-UBSCI)

DJ-UBS Commodity Index weighting by sector



Source: UBS

DJ-UBS Index weighting by contract



Source: UBS

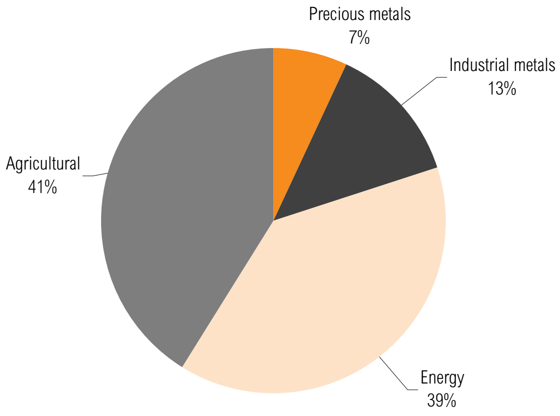
Determining weighting

The main factor for determining index weighting is liquidity of the individual futures contracts; a secondary consideration is the US dollar-adjusted global production of each component. Both calculations are averaged over five years. Other rules are meant to ensure that diversity is maintained; no related group can constitute more than 33% of the index and no individual component can constitute less than 2% or more than 15%. Revisions to the index's component weightings are decided in August and become effective in January.

The index is **rebalanced annually**, in early January, and individual contracts are **rolled six times annually**.

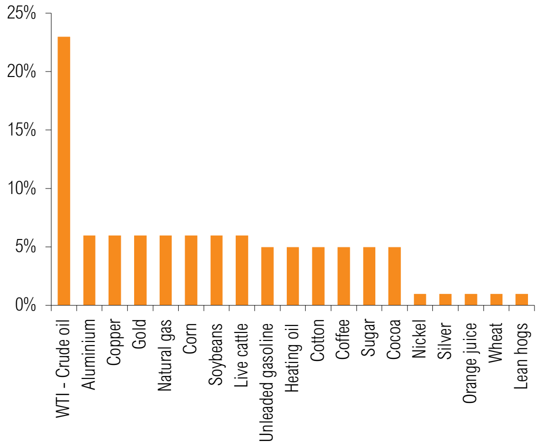
Reuters/Jefferies CRB index (RJ/CRB)

Reuters/Jefferies CRB index weighting by sector



Source: Bloomberg, RBS

Reuters/Jefferies CRB index weighting by contract



Source: Bloomberg RBS

Determining weighting

Unlike other indices that have their target weightings reviewed regularly, most commonly on an annual basis, the RJ/CRB's target weighting has been revised 10 times in 50 years, with its last revision being in 2005.

The R/JCRB index employs equitable distribution wherever feasible while reweighting exposure to selected markets, such as the economically important energy sector. The index is designed to be liquid and rational.

Rebalanced monthly. The index is reset to its target weightings every month. Monthly rebalancing increases transparency, reducing exposure to commodities that have traded higher, and increasing exposure to relatively inexpensive commodities.

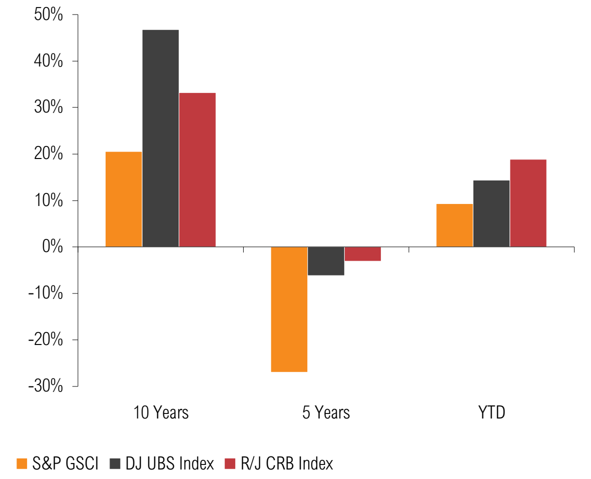
Roll frequency. This is variable depending on the category of commodity and its liquidity. Unlike other indices, contracts are rolled at numerous positions on the forward curve depending on liquidity to reduce exposure to steeper contangos close to expiry. Contracts are rolled using a four-day rollover schedule for each commodity, beginning on the first business day of each month.

Commodity indices – nasty negative roll in 2009

The commodity complex has been one of the key beneficiaries of the resurgence in appetite for risk across the investment community in Q2-Q4 09. Investor outflows undoubtedly exacerbated the decline in commodity prices in 2008, but demand for commodity products, including the commodity indices, returned in early 2009, and has almost certainly been one of the key factors driving the impressive recovery in commodity prices.

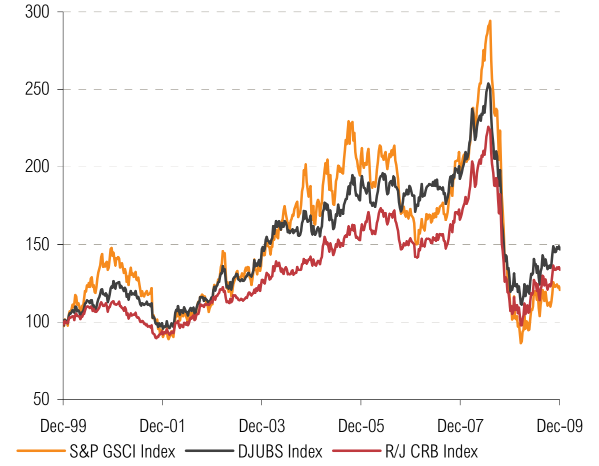
The risk rally has been broad-based, with many asset classes posting strong gains from their lows, but few more impressive than a number of the commodity heavyweights such as WTI crude oil which is up 105% and copper which is up more than 150%. However, gaining exposure to commodities is not as easy as other asset classes because investors tend to not want physical delivery of various commodities, exposing them to negative roll yield. Negative roll yield has been a major drag on the commodity indices in 2009, with the GSCI index up 40% from its low, the DJ UBS index up 31% and the R/J CRB index up 36%.

Commodity indices excess return over varying time periods (excess return includes cumulative roll yield)



Source: Bloomberg, RBS

Commodity indices 10-year excess return – Dec 1999 = 100 (excess return includes cumulative roll yield)



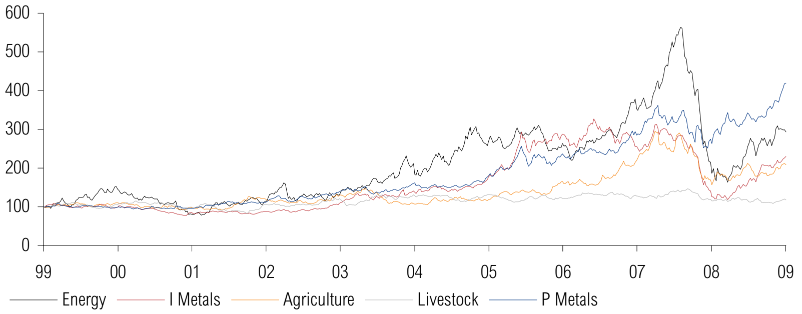
Source: Bloomberg, RBS

The differing component weighting and methodologies of the three key benchmark indices have produced varying excess returns. The key difference is the large exposure of the GSCI to the energy sector with an allocation of more than 50% to crude oil. This provided greater returns during the recent bull market, but also greater volatility and exposure to positive and negative roll yield.

Metals lead the commodity recovery in 2009

Although the GSCI has a heavy energy weighting, individual **spot** sub-indices offer an indication of the relative performance of the major commodity sectors.

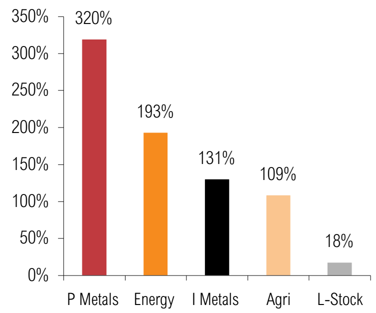
S&P GSCI spot sub-indices – 10-year performance (indexed December 1999 = 100)



Source: Bloomberg, RBS

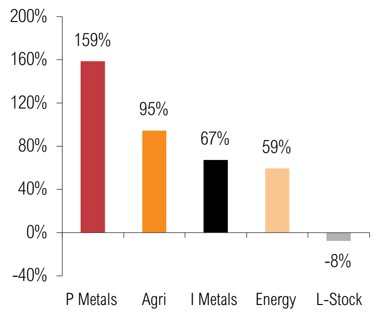
Over five and 10 years, the GSCI precious metals sub index (heavily dominated by gold) has been the best performer of the major commodity sub-sectors. This is largely because gold was one of the few commodities not to suffer significant losses in H2 09 and is trading at a near record high at end 2009. Heavyweight sectors, energy and metals, have performed similarly over both 5 and 10 years.

GSCI spot sub-indices, percentage moves over the past 10 years



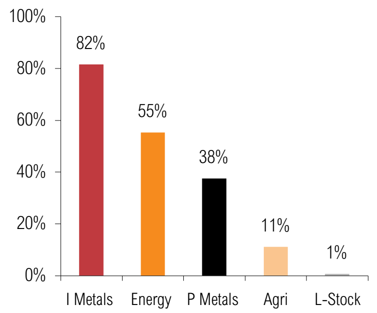
Source: Bloomberg, RBS

GSCI spot sub-indices, percentage moves over the past 5 years



Source: Bloomberg, RBS

GSCI spot sub-indices, percentage moves 2009 YTD



Source: Bloomberg, RBS

The most economically geared commodities, the industrial metals, have led the 2009 recovery in commodity prices, followed by energy. The agricultural and livestock sub-indices remained more subdued, benefiting less from the potential economic recovery and typically receiving less investor flows. The divergence in price performance year-to-date suggests commodity investors are positioning themselves to gain maximum leverage to an upturn in physical demand.

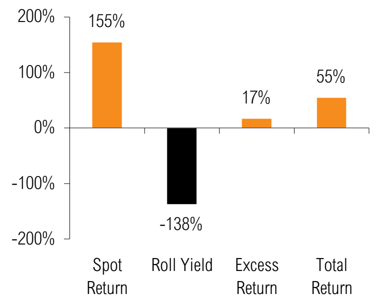
Negative roll yields limit commodity index returns in 2009

Although many of the commodity heavyweights have enjoyed impressive spot price gains in 2009, passive investors have struggled to capture these gains through commodity indices due to the impact of negative roll yield. During the last bull market, tight physical conditions resulted in backwardated forward curves for many key commodities (notably crude oil), benefiting index investors.

Commodity price gains in 2009 have been impressive, but they have been driven more by financial flows rather than tightness in the physical market. This has meant that the forward curves of most commodities have remained in steep contango, producing damaging negative roll yields for index investors.

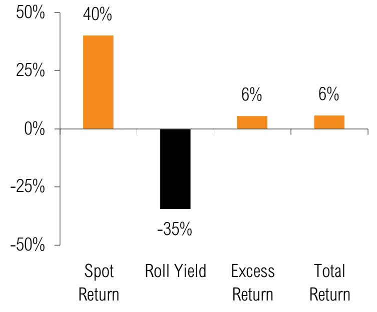
Comparing the spot and excess returns (including cumulative roll yield) in 2009 and over the last 10 years shows the impact of negative roll yield (see charts below). We continue to see negative roll yield as a concern for investors seeking to gain exposure to commodities through the indices.

GSCI component returns over the past 10 years



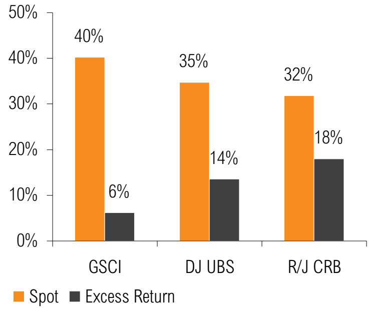
Source: Bloomberg, RBS

GSCI spot sub-indices, percentage returns 2009 YTD



Source: Bloomberg, RBS

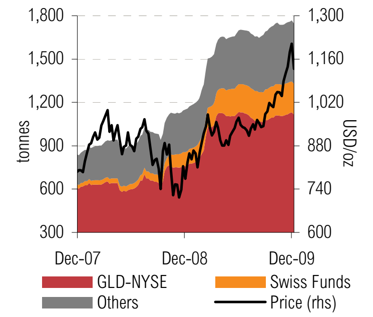
2009 YTD spot and excess returns of the benchmark indices



Source: Bloomberg, RBS

Precious metal ETFs – easy access to hard assets

ETF gold holdings vs US dollar-denominated gold price



Source: WGC, RBS

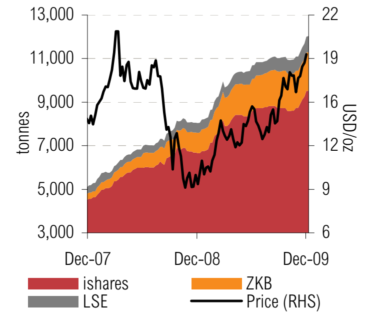
Central bank gold buying, led by India in early November, may have provided the catalyst for the surge in the gold price in all major currencies in Q4 09. But strong investment demand, in both the futures market and through the physically backed ETFs, has been a key driver, not only of gold's price gains, but also of the robust performances by silver, platinum and palladium.

The precious metal ETFs have seen two-way flows in recent months, but the strong price gains seen in Q4 09 across the precious metals brought with them fresh investor interest in the sector. Prior to gold's price correction in mid-December, all four families of precious metal ETFs stood at record highs in both volume and value terms. The resilience of the ETFs during the risk rally of Q2-Q3 demonstrates the versatile nature of precious metals (particularly gold), not only as a 'safe haven' but as a hedge against inflation and US dollar weakness.

We believe that metal held in physically backed ETFs is in relatively 'safe hands'. Although periods of modest net redemptions from the ETFs are likely in 2010 (as seen in Q3 09), the long-term investment case for commodities, and particularly precious metals, remains compelling. Consequently, we do not expect a mass exodus from the ETFs to be the cause of a material price correction in 2010.

For those investors looking to gain exposure to commodities as an asset class, the impact of roll yield has a significant impact on the returns of the commodity indices (see previous section). In our view, this increases the attraction of the physically backed precious metal ETFs over other commodity investment products. 'What you see is what you get' with the precious metal ETFs, providing 'easy access to hard assets'. We believe that desire to gain exposure to real assets will underpin investor interest in the precious metal ETFs in 2010.

12-month silver ETF holdings vs US$-denominated gold price



Source: iShares, ETF Securities, ZKB, RBS

Gold ETF holdings have increased by 556t (47%) so far in 2009, and currently stand at a near record of 1,745t. Inflows so far in 2009 are over 80% higher than the 318t of inflows seen in the whole of 2008, and account for over 20% of estimated 2009 global demand. YTD ETF value has risen by US$30bn (91%) to US$63bn.

Silver ETF holdings have risen by 3,774t (46%) YTD, to 12,027t, and their value has increased by US$3.8bn (135%), benefiting from a 60% YTD increase in the silver price. Silver's fundamental position remains a little shaky; we estimate that the market will sustain a significant surplus in 2009, largely as a result of weak industrial demand. However, strong investment demand, especially in ETFs, has absorbed this excess material, resulting in a broadly balanced market in 2009.

Platinum ETF holdings are up by 11.4t (124%) YTD, to a record 20.7t, and their value has increased by US$940m (253%), supported by a 61% price increase.

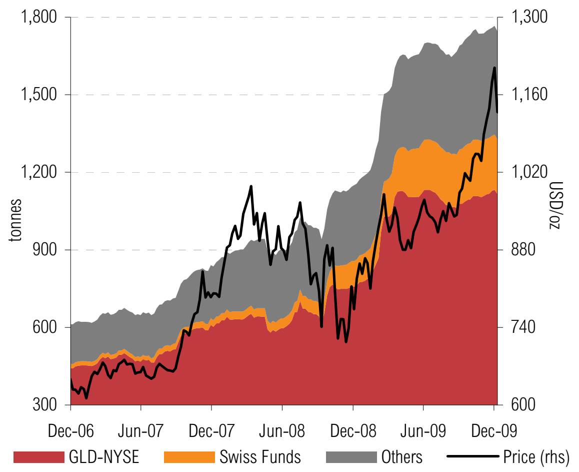
Palladium ETF holdings have increased by 15.6t (76%) YTD, to a record 36.2t, and their value has increased by US$304m (240%) to a total of US$425m.

Precious metal ETF summary (end-period values)

	Volume – tonnes						Value – US$m					
	2006	2007	2008	2009 ytd	Chg ytd	% of total	2006	2007	2008	2009 ytd	Chg ytd	% of total
Gold	621	872	1,189	1,745	47%	13%	12,622	23,362	33,078	63,323	91%	89%
Silver	3,768	5,297	8,253	12,027	46%	87%	1,563	2,514	2,863	6,724	135%	9%
Platinum	-	6.0	9.2	20.7	124%	0.1%	-	297	267	940	253%	1.3%
Palladium	-	8.7	20.6	36.2	76%	0.3%	-	102	121	425	250%	0.6%
Total	**4,389**	**6,183**	**9,472**	**13,829**	**46%**	**100%**	**14,185**	**26,275**	**36,329**	**71,413**	**97%**	**100%**

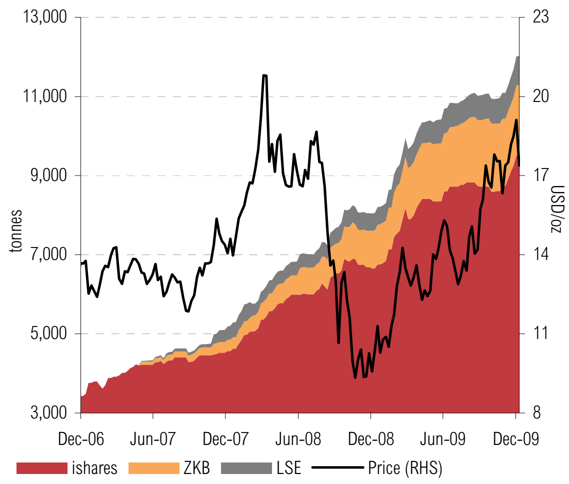
Source: ETF Securities, Zurcher Kantonalbank, iShares, WGC, LBMA, LPPM

Gold – ETF holdings and spot price – US$63bn



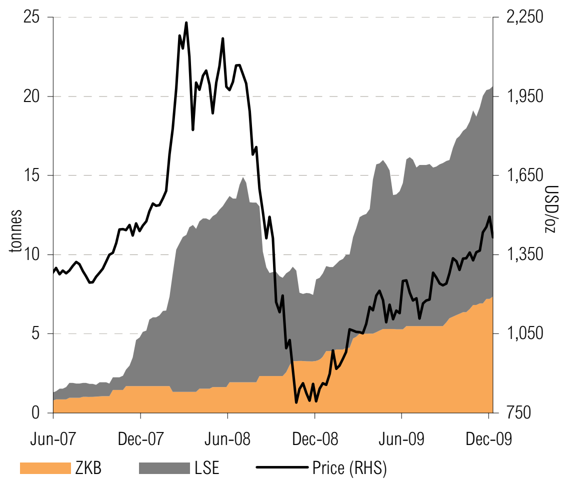
Source: WGC, LBMA

Silver – ETF holdings and spot price – US$6.7bn



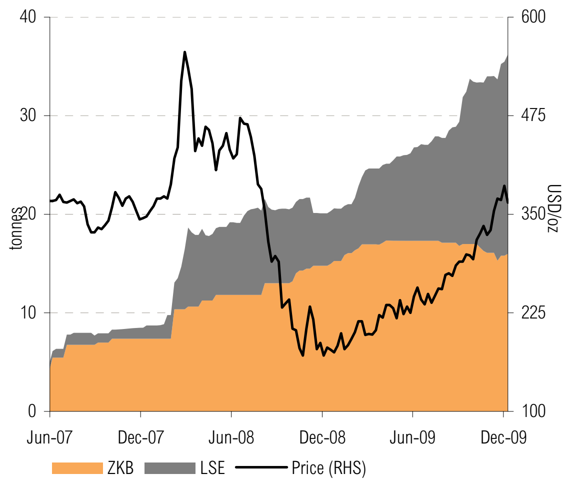
Source: ETF Securities, Zurcher Kantonalbank, iShares, LBMA

Platinum – ETF holdings and spot price – US$0.94bn



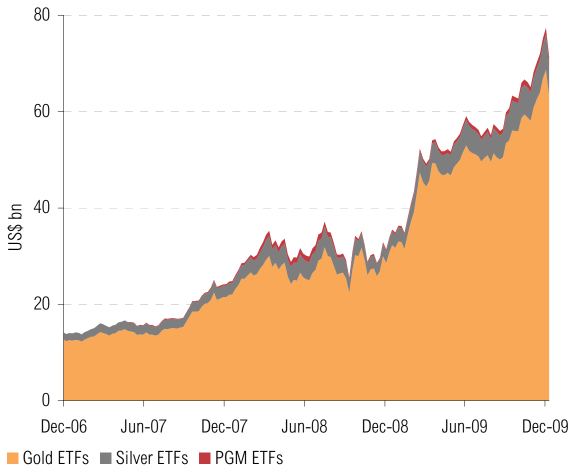
Source: ETF Securities, Zurcher Kantonalbank, LPPM

Palladium – ETF holdings and spot price – US$0.43bn



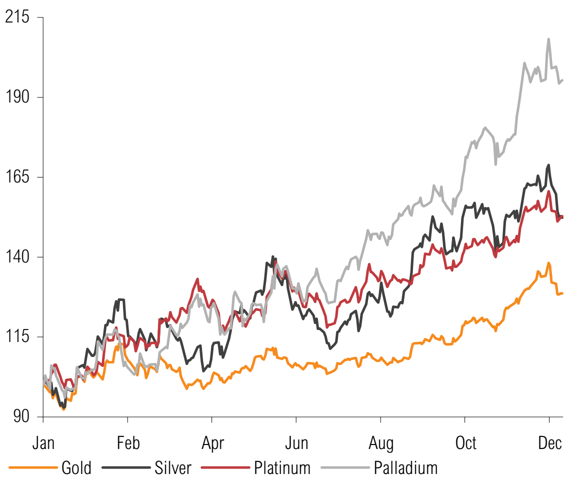
Source: ETF Securities, Zurcher Kantonalbank, LPPM

Value of total ETF holdings – US$71bn



Source: ETF Securities, Zurcher Kantonalbank, iShares, WGC, LBMA, LPPM

Precious metal prices (indexed January 2009)



Source: LBMA, LPPM

Aluminium – five-year global historical view of top producers and consumers

Global alumina production ranked by 2008 output ('000 tonnes)

					Top 5 =	86%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	6,994	8,510	13,696	19,456	22,784	27%	30.1%	17,414	16,752	-3.8%
Oceania	16,975	17,920	18,607	19,249	19,728	24%	3.3%	14,645	15,040	2.7%
Latin America	13,076	13,188	14,872	15,111	15,768	19%	4.8%	11,489	9,952	-13.4%
Asia	5,397	5,395	5,364	5,564	5,993	7%	3.0%	4,495	4,463	-0.7%
East/Central Europe	5,381	5,430	5,475	5,528	5,301	6%	0.4%	4,002	3,424	-14.4%
Western Europe	6,377	6,560	6,748	6,809	6,951	8%	2.6%	5,203	3,355	-35.5%
North America	6,887	6,928	6,799	6,076	6,160	7%	0.2%	4,664	2,641	-43.4%
Africa	779	736	530	526	595	1%	-4.0%	441	374	-15.2%
Global Total	**61,866**	**64,667**	**72,091**	**78,319**	**83,280**	**100%**	**7.2%**	**62,353**	**56,001**	**-10.2%**
Change	5.4%	4.5%	11.5%	8.6%	6.3%			Change	-6,352	

Source: Monthly Bulletin of the World Bureau of Metal Statistics and IAI – November 2009

Global refined aluminium metal production ranked by 2008 output ('000 tonnes)

					Top 5 =	63%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	6,689	7,806	9,358	12,559	13,177	34%	18.9%	10,134	9,066	-10.5%
Russia	3,594	3,647	3,718	3,955	3,800	10%	1.8%	2,850	2,765	-3.0%
Canada	2,592	2,894	3,051	3,083	3,119	8%	2.2%	2,334	2,269	-2.8%
Australia	1,895	1,903	1,932	1,959	1,974	5%	1.2%	1,475	1,457	-1.2%
US	2,517	2,480	2,281	2,560	2,659	7%	-0.3%	2,036	1,318	-35.3%
Brazil	1,457	1,498	1,604	1,655	1,661	4%	3.8%	1,245	1,155	-7.2%
India	861	942	1,105	1,222	1,308	3%	10.4%	956	1,097	14.7%
Norway	1,322	1,377	1,427	1,357	1,359	3%	2.7%	1,018	830	-18.5%
RSA	864	851	887	898	811	2%	2.0%	610	813	33.2%
UAE	683	850	789	890	892	2%	10.7%	708	708	0.0%
Others	7,462	7,769	7,823	7,970	8,500	22%	4.0%	6,384	5,713	-10.5%
Global total	**29,936**	**32,017**	**33,975**	**38,108**	**39,258**	**100%**	**7.0%**	**29,749**	**27,190**	**-8.6%**
Change	6.9%	7.0%	6.1%	12.2%	3.0%			Change	-2,559	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Global refined aluminium metal consumption ranked by 2008 consumption ('000 tonnes)

					Top 5 =	62%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	6,043	7,119	8,648	12,347	12,413	34%	19.1%	9,469	10,468	10.5%
US	5,800	6,114	6,150	5,545	4,906	13%	-2.8%	3,844	2,895	-24.7%
Japan	2,319	2,276	2,323	2,197	2,250	6%	0.1%	1,739	1,051	-39.6%
India	861	958	1,080	1,207	1,284	3%	10.0%	971	1,002	3.2%
Germany	1,795	1,759	1,823	2,008	1,950	5%	0.3%	1,562	872	-44.2%
Russia	1,020	1,020	1,047	1,020	1,020	3%	4.9%	765	765	0.0%
South Korea	1,118	1,201	1,153	1,081	964	3%	-0.4%	769	728	-5.3%
Brazil	651	759	773	854	932	3%	9.6%	693	570	-17.7%
Italy	987	977	1,021	1,087	951	3%	-0.1%	732	481	-34.3%
Canada	755	801	846	718	714	2%	-0.6%	527	472	-10.5%
Others	8,617	8,704	9,090	9,497	9,627	26%	4.4%	7,415	6,216	-16.2%
Global Total	**29,965**	**31,689**	**33,954**	**37,561**	**37,009**	**100%**	**6.0%**	**28,487**	**25,519**	**-10.4%**
Change	8.5%	5.8%	7.1%	10.6%	-1.5%			Change	-2,968	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Copper – five-year global historical view of top producers and consumers

Global copper mine production ranked by 2008 output ('000 tonnes)

					Top 5 =	62%		Jan-Aug		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
Chile	5,413	5,321	5,361	5,557	5,328	35%	*1.7%*	3,532	3,454	*-2.2%*
Peru	1,036	1,010	1,049	1,190	1,268	8%	*8.0%*	824	835	1.3%
US	1,174	1,157	1,222	1,194	1,335	9%	*3.4%*	868	819	*-5.7%*
Indonesia	843	1,065	816	789	651	4%	*-8.3%*	379	684	80.4%
China	754	777	889	946	951	6%	*9.1%*	612	631	3.1%
Australia	854	916	859	871	884	6%	*1.0%*	581	582	0.1%
Russian Federation	630	640	675	690	705	5%	*1.6%*	467	461	*-1.3%*
Zambia	402	433	474	509	546	4%	*7.6%*	349	367	5.1%
Canada	563	596	603	596	607	4%	*1.7%*	395	342	*-13.3%*
Poland	531	512	497	452	429	3%	*-3.2%*	288	298	3.4%
Others	2,395	2,498	2,545	2,669	2,686	17%	*3.0%*	1,745	1,867	7.0%
Global total	**14,594**	**14,924**	**14,990**	**15,463**	**15,388**	**100%**	**2.3%**	**10,038**	**10,338**	**3.0%**
Change	*6.1%*	*2.3%*	*0.4%*	*3.2%*	*-0.5%*			*Change*	*300*	

Source: Monthly Bulletin of the International Copper Study Group (ICSG) – November 2009

Global refined copper production ranked by 2008 output ('000 tonnes)

					Top 5 =	58%		Jan-Aug		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	2,199	2,600	3,003	3,499	3,791	21%	*15.6%*	2,536	2,638	4.0%
Chile	2,837	2,824	2,811	2,936	3,058	17%	*1.1%*	1,993	2,177	9.3%
Japan	1,380	1,395	1,532	1,577	1,540	8%	*1.5%*	1,021	955	*-6.4%*
US	1,306	1,255	1,250	1,311	1,282	7%	*-0.4%*	839	795	*-5.2%*
Russian Federation	919	935	951	949	862	5%	*0.5%*	576	525	*-8.9%*
India	405	493	625	715	662	4%	*11.1%*	445	473	6.5%
Germany	653	638	662	666	690	4%	*2.9%*	465	428	*-8.0%*
South Korea	496	519	576	582	531	3%	*0.8%*	352	340	*-3.5%*
Poland	550	560	557	533	527	3%	*-0.1%*	347	320	*-7.7%*
Canada	527	515	501	454	442	2%	*-0.6%*	329	227	*-31.1%*
Others	4,656	4,838	4,827	4,722	4,848	27%	*1.6%*	3,202	3,125	*-2.4%*
Global total	**15,928**	**16,573**	**17,295**	**17,944**	**18,232**	**100%**	**3.6%**	**12,104**	**12,003**	**-0.8%**
Change	*4.3%*	*4.0%*	*4.4%*	*3.8%*	*1.6%*			*Change*	*-101*	

Source: Monthly Bulletin of the International Copper Study Group (ICSG) – November 2009

Global refined copper consumption ranked by 2008 consumption ('000 tonnes)

					Top 5 =	59%		Jan-Aug		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	3,381	3,652	3,604	4,957	5,199	29%	*10.9%*	3,361	4,868	*44.9%*
US	2,415	2,274	2,130	2,137	2,020	11%	*-2.5%*	1,432	1,108	*-22.7%*
Germany	1,121	1,180	1,398	1,392	1,398	8%	*6.7%*	972	690	*-29.0%*
Japan	1,279	1,223	1,282	1,252	1,184	7%	*-0.3%*	818	537	*-34.4%*
South Korea	937	864	812	821	780	4%	*-3.0%*	532	510	*-4.0%*
India	350	415	440	475	520	3%	*10.8%*	341	358	*5.1%*
Italy	719	681	801	764	635	4%	*-0.9%*	424	333	*-21.3%*
Taiwan	690	638	639	603	582	3%	*-1.2%*	415	326	*-21.4%*
Russian Federation	588	635	692	671	650	4%	*7.8%*	451	236	*-47.6%*
France	550	505	540	440	410	2%	*-5.4%*	290	181	*-37.7%*
Others	4,811	4,606	4,705	5,164	4,629	26%	*0.0%*	3,186	2,887	*-9.4%*
Global total	**16,840**	**16,673**	**17,043**	**18,676**	**18,006**	**100%**	**2.8%**	**12,221**	**12,035**	**-1.5%**
Change	*7.2%*	*-1.0%*	*2.2%*	*9.6%*	*-3.6%*			*Change*	*-186*	

Source: Monthly Bulletin of the International Copper Study Group (ICSG) – November 2009

Nickel – five-year global historical view of top producers and consumers

Global nickel mine production ranked by 2008 output ('000 tonnes)

					Top 5=	70%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
Russia	289	289	290	294	287	19%	*-1.0%*	215	206	*-4.2%*
Canada	187	200	233	255	260	17%	*9.8%*	193	116	*-40.0%*
Australia	187	186	185	185	200	13%	*0.9%*	151	122	*-19.2%*
Indonesia	153	156	157	229	193	13%	*4.0%*	151	136	*-10.3%*
New Caledonia	118	112	103	125	103	7%	*-1.7%*	75	66	*-11.9%*
Philippines	17	29	65	91	84	6%	*33.9%*	70	134	*91.3%*
China	76	73	82	66	72	5%	*3.2%*	50	62	*23.8%*
Cuba	72	72	74	74	67	5%	*0.1%*	50	52	*3.4%*
Colombia	49	53	51	49	42	3%	*-2.8%*	29	38	*31.0%*
South Africa	40	42	42	38	32	2%	*-5.0%*	24	26	*8.4%*
Others	151	160	163	163	147	10%	*-1.8%*	116	89	*-23.6%*
Global Total	**1,339**	**1,371**	**1,445**	**1,570**	**1,484**	**100%**	**2.3%**	**1,124**	**1,046**	**-7.0%**
Change	*1.3%*	*2.4%*	*5.4%*	*8.7%*	*-5.5%*			*Change*	*-79*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Global refined nickel production ranked by 2008 output ('000 tonnes)

					Top 5=	64%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	76	95	132	220	171	13%	*21.3%*	130	181	*39.1%*
Russia	261	268	274	267	260	19%	*-0.2%*	193	180	*-6.7%*
Japan	169	164	152	161	157	12%	*-0.8%*	122	106	*-13.6%*
Australia	122	122	116	114	108	8%	*-3.5%*	80	99	*23.6%*
Canada	152	140	147	154	168	12%	*6.2%*	127	95	*-25.1%*
Norway	71	85	82	88	89	7%	*2.9%*	66	62	*-6.6%*
Colombia	49	53	51	49	42	3%	*-2.8%*	29	38	*31.0%*
Finland	50	39	48	55	52	4%	*-0.5%*	37	31	*-17.2%*
New Caledonia	43	47	49	45	38	3%	*-6.0%*	26	28	*7.4%*
Cuba	42	44	44	43	35	3%	*-2.1%*	26	26	*0.4%*
Others	216	232	241	252	237	17%	*3.6%*	183	140	*-23.7%*
Global Total	**1,251**	**1,288**	**1,336**	**1,447**	**1,354**	**100%**	**2.3%**	**1,019**	**984**	**-3.4%**
Change	*3.3%*	*2.9%*	*3.7%*	*8.3%*	*-6.4%*			*Change*	*-35*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Global refined nickel consumption ranked by 2008 consumption ('000 tonnes)

					Top 5=	59%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2007**	**2008**	**Change**
China	144	197	234	328	305	24%	*18.1%*	235	444	*88.9%*
Japan	195	180	181	196	185	14%	*-0.3%*	145	106	*-27.0%*
US	128	135	145	119	121	9%	*0.7%*	95	68	*-27.9%*
Germany	94	116	106	110	90	7%	*-1.1%*	67	41	*-39.5%*
Italy	62	60	68	64	68	5%	*-0.9%*	50	29	*-41.8%*
South Korea	123	118	93	71	76	6%	*-7.7%*	62	69	*11.8%*
Taiwan	91	84	107	76	69	5%	*-7.7%*	56	51	*-9.8%*
South Africa	45	47	54	44	44	3%	*2.0%*	37	31	*-16.3%*
Finland	59	49	51	40	41	3%	*-8.8%*	33	11	*-67.6%*
Spain	48	48	53	42	41	3%	*-3.2%*	33	16	*-50.8%*
Others	262	262	275	264	257	20%	*-1.4%*	197	141	*-28.5%*
Global total	**1,251**	**1,296**	**1,366**	**1,354**	**1,297**	**100%**	**0.8%**	**1,009**	**1,006**	**-0.3%**
Change	*0.1%*	*3.6%*	*5.4%*	*-0.9%*	*-4.2%*			*Change*	*-3*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Zinc – five-year global historical view of top producers and consumers

Global zinc mine production ranked by 2008 output ('000 tonnes)

					Top 5 =	66%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	2,391	2,547	2,844	3,048	3,186	27%	*9.4%*	2,343	2,060	*-12.1%*
Peru	1,209	1,202	1,202	1,444	1,603	14%	*3.2%*	1,195	1,104	*-7.6%*
Australia	1,298	1,329	1,338	1,498	1,479	13%	*0.4%*	1,096	957	*-12.7%*
Canada	791	667	638	630	716	6%	*-1.9%*	534	531	*-0.6%*
US	739	748	727	803	779	7%	*0.3%*	602	516	*-14.3%*
India	355	472	503	558	616	5%	*15.1%*	462	482	*4.3%*
Kazakhstan	361	364	410	446	459	4%	*3.2%*	344	369	*7.3%*
Mexico	426	476	469	452	442	4%	*1.3%*	330	363	*10.0%*
Bolivia	147	160	173	214	384	3%	*21.5%*	276	330	*19.6%*
Ireland	438	445	426	401	398	3%	*-1.0%*	305	298	*-2.3%*
Others	1,554	1,736	1,717	1,635	1,640	14%	*2.6%*	1,234	1,228	*-0.5%*
Global total	**9,709**	**10,146**	**10,447**	**11,129**	**11,702**	**100%**	**4.2%**	**8,721**	**8,238**	**-5.5%**
yoy change	*2.0%*	*4.5%*	*3.0%*	*6.5%*	*5.1%*			*Change*	*-483*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – November 2009

Global refined zinc production ranked by 2008 output ('000 tonnes)

					Top 5 =	57%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	2,720	2,776	3,163	3,743	3,913	34%	*11.0%*	2,933	3,019	*2.9%*
Canada	805	724	824	802	764	7%	*0.1%*	586	512	*-12.6%*
India	272	302	415	459	606	5%	*16.7%*	437	506	*15.8%*
South Korea	669	647	667	691	739	6%	*2.8%*	560	477	*-14.8%*
Japan	635	638	614	598	616	5%	*-1.1%*	464	388	*-16.4%*
Australia	474	457	466	502	499	4%	*-2.0%*	373	386	*3.5%*
Spain	523	500	507	509	466	4%	*-2.1%*	350	383	*9.4%*
Mexico	337	336	285	320	321	3%	*0.1%*	236	249	*5.5%*
Kazakhstan	317	357	365	358	366	3%	*5.6%*	273	246	*-9.9%*
Germany	358	335	317	295	292	3%	*-5.5%*	224	103	*-54.0%*
Others	3,282	3,150	3,032	3,083	3,073	26%	*-0.6%*	2,326	1,983	*-14.7%*
Global total	**10,392**	**10,222**	**10,655**	**11,360**	**11,655**	**100%**	**3.4%**	**8,762**	**8,252**	**-5.8%**
yoy change	*5.2%*	*-1.6%*	*4.2%*	*6.6%*	*2.6%*			*Change*	*-510*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – November 2009

Global refined zinc consumption ranked by 2008 consumption ('000 tonnes)

					Top 5 =	57%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	2,690	3,041	3,156	3,563	4,015	35%	*13.3%*	3,030	3,497	*15.4%*
US	1,247	1,078	1,153	1,016	1,003	9%	*-2.7%*	767	693	*-9.6%*
Japan	347	388	430	455	485	4%	*-4.8%*	362	386	*6.6%*
Germany	623	602	594	588	564	5%	*0.9%*	434	288	*-33.6%*
South Korea	446	476	534	512	504	4%	*0.9%*	384	280	*-27.1%*
India	514	511	564	543	527	5%	*9.2%*	412	248	*-39.8%*
Belgium	365	345	360	387	382	3%	*1.8%*	290	221	*-23.8%*
Italy	389	395	313	398	318	3%	*-1.8%*	239	165	*-31.0%*
France	298	275	285	275	252	2%	*-2.8%*	198	164	*-17.2%*
Brazil	242	222	238	248	248	2%	*2.2%*	194	121	*-37.6%*
Others	3,487	3,278	3,389	3,322	3,140	27%	*-1.3%*	2,427	1,848	*-23.9%*
Global total	**10,648**	**10,611**	**11,016**	**11,307**	**11,438**	**100%**	**3.1%**	**8,737**	**7,911**	**-9.5%**
yoy change	*8.2%*	*-0.3%*	*3.8%*	*2.6%*	*1.2%*			*Change*	*-826*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – November 2009

Lead – five-year global historical view of top producers and consumers

Global lead mine production ranked by 2008 output ('000 tonnes)

					Top 5 =	78%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	997	1,142	1,331	1,402	1,543	40%	*10.1%*	1,145	1,215	*6.1%*
Australia	642	715	621	589	594	15%	*-1.7%*	440	380	*-13.6%*
US	445	436	429	444	410	11%	*-2.2%*	308	304	*-1.3%*
Peru	306	319	313	329	345	9%	*2.3%*	225	217	*-3.6%*
Mexico	118	135	135	137	141	4%	*0.3%*	105	116	*10.5%*
Bolivia	10	11	12	20	82	2%	*52.3%*	58	74	*27.6%*
India	51	60	69	78	84	2%	*13.8%*	63	66	*4.8%*
Russia	23	36	34	48	60	2%	*20.1%*	45	59	*31.1%*
Canada	77	79	83	75	99	3%	*4.1%*	78	53	*-32.1%*
Sweden	54	60	56	63	64	2%	*5.1%*	48	53	*10.4%*
Others	408	429	442	438	474	12%	*3.3%*	388	353	*-9.0%*
Global total	**3,131**	**3,422**	**3,525**	**3,623**	**3,896**	**100%**	**4.5%**	**2,903**	**2,890**	**-0.4%**
yoy change	*0.4%*	*9.3%*	*3.0%*	*2.8%*	*7.5%*			*Change*	*-13*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – November 2009

Global refined lead metal production ranked by 2008 output ('000 tonnes)

					Top 5=	63%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	1,934	2,391	2,715	2,788	3,206	37%	*15.4%*	2,323	2,760	*18.8%*
US	1,262	1,293	1,303	1,303	1,280	15%	*-1.7%*	955	930	*-2.6%*
Germany	411	418	379	405	415	5%	*3.1%*	321	282	*-12.1%*
UK	243	304	298	275	303	3%	*-1.1%*	224	232	*3.6%*
South Korea	243	256	240	260	270	3%	*3.3%*	203	217	*6.9%*
Canada	241	230	250	237	259	3%	*3.0%*	192	185	*-3.6%*
Australia	273	268	241	238	261	3%	*-3.2%*	195	184	*-5.6%*
Japan	283	275	280	276	279	3%	*-1.1%*	212	179	*-15.6%*
Mexico	242	256	253	255	255	3%	*1.3%*	192	168	*-12.5%*
Italy	202	211	191	212	200	2%	*-1.3%*	150	117	*-22.0%*
Others	1,664	1,721	1,774	1,868	1,943	22%	*3.7%*	1,463	1,322	*-9.6%*
Global total	**6,998**	**7,623**	**7,924**	**8,117**	**8,671**	**100%**	**5.1%**	**6,430**	**6,576**	**2.3%**
yoy change	*3.5%*	*8.9%*	*3.9%*	*2.4%*	*6.8%*			*Change*	*146*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – November 2009

Global refined lead metal consumption ranked by 2008 consumption ('000 tonnes)

					Top 5 =	66%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	1,510	1,973	2,213	2,573	3,211	37%	*22.1%*	2,316	2,908	*25.6%*
US	1,502	1,587	1,622	1,510	1,515	17%	*0.0%*	1,161	1,052	*-9.4%*
Germany	395	407	387	409	369	4%	*-0.8%*	296	240	*-18.9%*
South Korea	376	384	337	342	312	4%	*-2.2%*	232	222	*-4.3%*
Italy	272	269	285	269	276	3%	*1.4%*	215	165	*-23.3%*
UK	295	271	270	239	236	3%	*-4.8%*	180	165	*-8.3%*
Spain	246	270	272	260	248	3%	*2.8%*	189	153	*-19.0%*
Japan	292	291	303	279	261	3%	*-3.4%*	201	128	*-36.3%*
Mexico	262	267	271	235	215	2%	*-3.7%*	164	120	*-26.8%*
France	215	215	210	210	190	2%	*-2.9%*	149	105	*-29.5%*
Others	1,931	1,852	1,893	1,856	1,832	21%	*0.0%*	1,370	1,256	*-8.3%*
Global total	**7,296**	**7,786**	**8,063**	**8,182**	**8,665**	**100%**	**4.9%**	**6,473**	**6,514**	**0.6%**
yoy change	*6.9%*	*6.7%*	*3.6%*	*1.5%*	*5.9%*			*Change*	*41*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – November 2009

Tin – five-year global historical view of top producers and consumers

Global tin mine production ranked by 2008 output ('000 tonnes)

					Top 5 =	91%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	118	122	126	147	121	38%	*4.3%*	86	90	*4.5%*
Indonesia	78	120	118	102	96	30%	*8.4%*	75	63	*-16.0%*
Peru	42	42	39	39	39	12%	*-0.6%*	29	28	*-3.8%*
Bolivia	18	19	18	16	17	5%	*1.1%*	12	14	*8.9%*
Brazil	12	12	10	13	13	4%	*1.3%*	10	10	*0.0%*
DRC	6	8	7	12	11	3%	*35.1%*	8	7	*-16.0%*
Russia	3	3	3	2	1	0%	*-27.3%*	1	1	*-37.5%*
Others	14	18	15	18	18	6%	*0.8%*	13	16	*25.2%*
Global total	**291**	**343**	**335**	**350**	**316**	**100%**	**4.3%**	**234**	**228**	**-2.8%**
Change	*13.8%*	*17.8%*	*-2.2%*	*4.2%*	*-9.6%*			*Change*	*-7*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Global refined tin metal production ranked by 2008 output ('000 tonnes)

					Top 5 =	87%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	115	122	132	149	129	39%	*5.6%*	94	93	*-1.4%*
Indonesia	87	78	77	78	70	21%	*2.1%*	55	49	*-11.0%*
Peru	41	38	41	36	38	11%	*-0.6%*	28	26	*-5.4%*
Malaysia	34	39	23	26	32	10%	*11.5%*	24	29	*19.9%*
Thailand	21	29	26	18	22	7%	*7.4%*	16	17	*0.6%*
Bolivia	14	16	15	12	12	4%	*5.2%*	9	11	*21.6%*
Brazil	12	9	9	10	11	3%	*0.0%*	8	8	*1.2%*
Belgium	9	8	8	8	9	3%	*3.6%*	7	6	*-11.8%*
India	4	4	4	4	4	1%	*0.0%*	3	3	*0.0%*
Vietnam	2	2	3	3	4	1%	*15.5%*	3	3	*0.0%*
Others	6	5	14	7	3	1%	*-19.7%*	2	2	*-21.7%*
Global total	**343**	**350**	**351**	**349**	**333**	**100%**	**3.8%**	**249**	**246**	**-1.3%**
Change	*24.3%*	*1.9%*	*0.5%*	*-0.6%*	*-4.8%*			*Change*	*-3*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Global refined tin metal consumption ranked by 2008 consumption ('000 tonnes)

					Top 5 =	66%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	93	116	115	134	128	38%	*12.2%*	91	100	*10.8%*
Japan	33	33	39	34	32	10%	*2.3%*	25	16	*-36.0%*
US	54	42	47	33	26	8%	*-10.2%*	20	22	*5.9%*
Germany	20	19	21	23	21	6%	*-0.2%*	17	9	*-43.0%*
South Korea	16	18	17	16	16	5%	*-1.1%*	13	11	*-14.2%*
Taiwan	13	14	18	13	12	4%	*2.0%*	10	7	*-29.2%*
India	6	8	8	9	9	3%	*5.9%*	7	6	*-16.4%*
France	9	7	8	7	6	2%	*-7.7%*	5	4	*-22.9%*
Others	90	88	91	88	87	26%	*-1.1%*	68	56	*-17.2%*
Global total	**334**	**345**	**363**	**356**	**337**	**100%**	**2.2%**	**254**	**230**	**-9.3%**
Change	*10.7%*	*3.3%*	*5.2%*	*-1.8%*	*-5.4%*			*Change*	*-24*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – November 2009

Global cobalt mine production

Top cobalt mine producers ranked by 2008 market share

000 tonnes					Top 5 =	73%		2008-09 yoy
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**Change**
China	8,000	12,700	12,700	13,245	18,239	33%	*31.9%*	*37.7%*
Finland	7,893	8,170	8,580	9,100	8,950	16%	*2.3%*	*-1.6%*
Canada	4,787	4,954	5,023	5,606	5,628	10%	*6.3%*	*0.4%*
Zambia	5,791	5,422	4,665	4,335	3,841	7%	*-10.3%*	*-11.4%*
Norway	4,670	5,021	4,927	3,939	3,719	7%	*-4.0%*	*-5.6%*
Australia	3,879	3,150	3,696	3,684	3,617	6%	*-1.2%*	*-1.8%*
Belgium	2,947	3,298	2,840	2,825	3,020	5%	*12.1%*	*6.9%*
Russia	4,524	4,748	4,759	3,587	2,502	4%	*-11.7%*	*-30.2%*
Morocco	1,593	1,613	1,405	1,591	1,711	3%	*3.6%*	*7.5%*
Brazil	1,155	1,136	902	1,148	994	2%	*-2.0%*	*-13.4%*
Others	2,665	3,423	3,841	3,980	3,453	6%	*8.5%*	*-13.2%*
Global total	**47,904**	**53,635**	**53,338**	**53,040**	**55,674**	**100%**	**5.3%**	**5.0%**
Change	*11.6%*	*12.0%*	*-0.6%*	*-0.6%*	*5.0%*			

Source: World Bureau of Metal Statistics 2008 Yearbook - November

Global Molybdenum Mine Production

Top molybdenum producers ranked by 2008 market share

000 tonnes					Top 5 =	90%		Jan-Sep		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**Change**
China	38.4	39.8	43.2	67.7	81.3	37%	21.7%	59.6	64.9	*8.9%*
USA	41.5	58.0	59.4	57.2	55.8	25%	10.7%	44.2	34.3	*-22.4%*
Chile	41.9	47.7	43.3	44.8	33.7	15%	0.2%	24.6	25.9	5.3%
Peru	14.2	17.3	17.2	16.8	16.7	8%	11.7%	12.7	9.0	*-29.1%*
Canada	9.9	7.7	7.1	6.8	9.3	4%	0.9%	5.8	6.7	*15.5%*
Mexico	3.7	4.2	2.5	6.5	7.8	4%	17.4%	5.7	7.3	*28.1%*
Russia	4.8	4.8	4.8	4.8	4.8	2%	0.0%	3.6	3.6	*0.0%*
Armenia	3.0	2.7	4.1	4.3	4.5	2%	10.0%	3.4	3.2	*-5.9%*
Mongolia	1.2	1.2	1.4	2.0	1.9	1%	1.1%	1.4	1.8	*28.6%*
Iran	1.8	1.8	1.8	1.8	2.9	1%	7.7%	2.2	2.3	*4.5%*
Others	0.7	0.5	0.7	0.8	0.9	0%	5.2%	0.8	0.7	*-12.5%*
Global total	**161.1**	**185.7**	**185.5**	**213.5**	**219.6**	**100%**	**10.8%**	**164.0**	**159.7**	**-2.6%**
Change	*22.7%*	*15.3%*	*-0.1%*	*15.1%*	*2.9%*			*yoy*	*-4.3*	

Source: World Bureau of Metal Statistics 2008 Yearbook - November

Bulks – five-year global historical view of top producers and consumers

Top 10 iron ore producers and consumers ranked by 2007 market share

Global iron ore production by region (million wet tonnes)

					Top 5 =	88%	5 yrs
Country	**2003**	**2004**	**2005**	**2006**	**2007**	**% Mkt.**	**% pa**
China	261	310	426	588	707	35%	*25.0%*
Brazil	246	271	292	319	355	18%	*9.5%*
Australia	212	235	258	275	299	15%	*9.8%*
India	99	121	143	181	207	10%	*19.1%*
CIS	172	184	184	198	202	10%	*5.0%*
US	49	55	54	53	52	3%	*0.2%*
S Africa	38	39	40	41	42	2%	*2.7%*
Canada	33	29	30	34	32	2%	*1.3%*
Sweden	22	22	23	23	25	1%	*4.0%*
Venezuela	19	20	21	22	23	1%	*1.5%*
Others	64	78	79	85	75	4%	*4.2%*
Global total	**1,214**	**1,363**	**1,550**	**1,820**	**2,019**	**100%**	***12.7%***
Chg	*9.4%*	*12.3%*	*13.8%*	*17.4%*	*10.9%*		
Chg (mt)	*104*	*149*	*188*	*269*	*199*		

Global iron ore apparent consumption by region (million wet tonnes)

					Top 5	= 77%	5 yrs
Country	**2003**	**2004**	**2005**	**2006**	**2007**	**% Mkt.**	**% pa**
China	420	518	701	914	1,091	54%	*25.2%*
CIS	141	146	145	151	151	7%	*2.9%*
Japan	132	135	132	134	139	7%	*1.5%*
India	43	59	63	92	114	6%	*29.0%*
Brazil	61	70	69	72	66	3%	*3.6%*
US	54	58	56	56	52	3%	*-1.9%*
Germany	39	47	42	45	47	2%	*0.8%*
S Korea	43	45	44	44	47	2%	*1.3%*
Australia	17	16	20	29	34	2%	*17.9%*
France	19	21	20	20	19	1%	*0.4%*
Others	244	249	258	262	259	13%	*2.5%*
Global total	**1,214**	**1,363**	**1,550**	**1,820**	**2,018**	**100%**	***12.7%***
Chg	*9.4%*	*12.3%*	*13.8%*	*17.4%*	*10.9%*		
Chg (mt)	*104*	*149*	*188*	*269*	*199*		

Source: AME Mineral Economics – August 2008

Top 10 coal producers and consumers ranked by 2008 market share

Global coal* production by region (million tonnes oil equivalent)**

					Top 5 =	78%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
China	1,012	1,120	1,205	1,282	1,415	43%	*10.3%*
US	572	580	595	587	597	18%	*1.5%*
Australia	198	207	211	219	220	7%	*3.0%*
India	156	162	170	181	194	6%	*6.2%*
Russia	132	139	145	148	153	5%	*3.8%*
RSA	137	138	138	140	141	4%	*1.0%*
Indonesia	81	94	119	134	141	4%	*17.3%*
Poland	70	69	67	62	61	2%	*6.9%*
Kazakh.	44	44	49	50	59	2%	*-3.8%*
Germany	55	53	50	52	48	1%	*-2.5%*
Others	274	279	287	295	297	9%	*1.8%*
Global total	**2,732**	**2,884**	**3,036**	**3,150**	**3,325**	**100%**	***5.7%***
Chg %	*8.4%*	*5.6%*	*5.3%*	*3.7%*	*5.6%*		
Chg (MTOE)**	*212*	*152*	*152*	*113*	*175*		

Global coal* consumption by region (million tonnes oil equivalent)**

					Top 5	= 74%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
China	983	1,101	1,215	1,314	1,406	43%	10.5%
US	566	574	566	573	565	17%	0.1%
India	172	184	195	213	231	7%	8.1%
Japan	121	121	119	125	129	4%	2.8%
RSA	95	92	94	98	103	3%	2.9%
Russia	100	94	97	94	101	3%	-0.5%
Germany	85	82	84	86	81	2%	-1.4%
S. Korea	53	55	55	60	66	2%	5.3%
Poland	57	56	58	57	59	2%	0.5%
Australia	53	55	57	56	51	2%	0.5%
Others	481	494	502	519	511	15%	*1.5%*
Global total	**2,766**	**2,907**	**3,042**	**3,195**	**3,304**	**100%**	***4.9%***
Chg %	*6.5%*	*5.1%*	*4.6%*	*5.0%*	*3.4%*		
Chg (MTOE)**	*169*	*141*	*135*	*153*	*109*		

*Commercial solid fuels only, i.e., bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal.
**1m tonnes of oil or equivalent produces approximately 4,400 gigawatt-hours of electricity in a modern power station.
Source: BP Statistical Review of World Energy – June 2009

Precious metals – five-year historical view of top producers and consumers

Top 10 gold producers and consumers ranked by 2008 market share

Global gold mine (tonnes)								Global gold fabrication demand (tonnes)							
					Top 5 =	48%	5 yrs						Top 5	= 53%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**	**Country**	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
China	217	230	247	281	292	12%	*6.7%*	India	618	695	633	684	578	20%	*1.4%*
US	260	262	252	238	235	10%	*-3.6%*	China	236	258	270	327	342	12%	*10.2%*
S. Africa	363	315	296	270	233	10%	*-10.1%*	Turkey	285	303	242	277	237	8%	*-1.9%*
Australia	258	263	247	246	215	9%	*-5.3%*	Italy	315	284	227	218	180	6%	*-11.6%*
Russia	182	175	173	169	189	8%	*0.7%*	US	224	219	211	180	176	6%	*-4.8%*
Peru	173	208	202	170	180	7%	*0.9%*	Japan	159	164	175	178	164	6%	*1.6%*
Canada	129	120	104	102	96	4%	*-7.3%*	Saudi Arabia	118	125	90	100	87	3%	*-4.6%*
Indonesia	114	165	116	147	95	4%	*-10.4%*	South Korea	82	83	82	86	78	3%	*-1.7%*
Ghana	58	63	70	77	80	3%	*3.1%*	Russia	55	61	65	79	76	3%	*8.7%*
Uzbekistan	84	76	74	75	77	3%	*-0.8%*	Indonesia	91	87	65	63	61	2%	*-6.5%*
Others	657	674	704	703	724	30%	*2.5%*	Others	988	1,013	875	884	871	31%	*-1.6%*
Global	**2,494**	**2,550**	**2,485**	**2,478**	**2,416**	**100%**	***-1.6%***	**Global**	**3,172**	**3,291**	**2,936**	**3,076**	**2,850**	**100%**	***-1.0%***
Chg	*-4.8%*	*2.2%*	*-2.5%*	*-0.3%*	*-2.5%*			**Chg**	*5.8%*	*3.8%*	*-10.8%*	*4.8%*	*-7.3%*		
US$/oz	410	445	604	697	872			**US$/oz**	410	445	604	697	872		

Source: GFMS, Gold Survey 2009

Top 10 silver producers and consumers ranked by 2008 market share

Global silver mine (tonnes)								Global silver fabrication demand (tonnes)							
					Top 5	= 61%	5 yrs						Top 5	= 63%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**	**Country**	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
Peru	3,060	3,191	3,456	3,502	3,680	17%	*4.7%*	US	5,608	5,891	5,778	5,604	5,807	22%	*1.3%*
Mexico	2,569	2,896	2,970	3,135	3,241	15%	*4.8%*	Japan	3,826	3,860	4,097	4,155	4,151	16%	*2.8%*
China	1,967	2,084	2,342	2,451	2,575	12%	*7.1%*	India	2,163	2,850	2,575	2,770	2,868	11%	*-2.8%*
Chile	1,360	1,378	1,602	1,928	1,397	7%	*1.3%*	China	1,835	1,917	2,166	2,358	2,351	9%	*7.5%*
Australia	2,222	2,407	1,729	1,879	1,925	9%	*0.6%*	Germany	1,257	1,260	1,275	1,249	1,264	5%	*0.8%*
Poland	1,362	1,260	1,260	1,232	1,210	6%	*-2.5%*	Italy	1,722	1,577	1,442	1,358	1,198	5%	*-7.1%*
Russia	1,233	1,011	974	911	1,123	5%	*1.0%*	CIS	879	926	963	1,048	1,082	4%	*5.4%*
US	1,250	1,219	1,141	1,260	1,120	5%	*-2.0%*	Thailand	1,151	1,150	1,150	1,140	1,041	4%	*-1.8%*
Canada	1,295	1,064	970	830	669	3%	*-12.1%*	Belgium	858	814	894	850	792	3%	*-2.7%*
Kazakhstan	703	812	796	706	628	3%	*-4.8%*	UK/ Ireland	1,604	1,330	1,013	780	729	3%	*-11.6%*
Others	2,298	2,494	2,706	2,824	3,611	17%	*8.3%*	Others	4,927	4,773	4,592	4,824	4,613	18%	*-1.5%*
Global total	**19,319**	**19,816**	**19,947**	**20,659**	**21,178**	**100%**	***2.5%***	**Global total**	**25,830**	**26,348**	**25,945**	**26,136**	**25,896**	**100%**	***-0.2%***
Chg	*3.4%*	*2.6%*	*0.7%*	*3.6%*	*2.5%*			**Chg**	*-1.3%*	*2.0%*	*-1.5%*	*0.7%*	*-0.9%*		
US$/oz	6.66	7.31	11.55	13.38	14.99			**US$/oz**	6.66	7.31	11.55	13.38	14.99		

Source: Silver Institute (GFMS) World Silver Survey 2009

Precious metals – five-year historical view of top producers and consumers

Top platinum producers and consumers ranked by 2008 market share

Global platinum mine production ('000 oz)

Country	2004	2005	2006	2007	2008	% Mkt.	5yrs % pa
S Africa	4,961	5,054	5,447	5,074	4,671	76%	*-0.1%*
Russia	840	960	948	917	835	14%	*0.0%*
N Am	374	358	366	328	342	6%	*4.0%*
Others	238	252	263	264	303	5%	*7.1%*
Global	**6,413**	**6,624**	**7,024**	**6,583**	**6,151**	**100%**	***0.4%***
Chg	*6.4%*	*3.3%*	*6.0%*	*-6.3%*	*-6.6%*		
US$/oz	846	897	1,143	1,305	1,572		

Global platinum consumption ('000 oz)

Country	2004	2005	2006	2007	2008	% Mkt.	5yrs % pa
Europe	2,226	2,432	2,566	2,608	2,493	32%	*4.6%*
China	1,743	1,677	1,512	1,255	1,341	17%	*-2.6%*
N Am	1,472	1,440	1,381	1,391	1,253	16%	*-5.3%*
Others	2,325	2,262	2,392	2,707	2,707	35%	*1.7%*
Global	**7,766**	**7,811**	**7,851**	**7,961**	**7,794**	**100%**	***0.4%***
Chg	*1.5%*	*0.6%*	*0.5%*	*1.4%*	*-2.1%*		
US$/oz	846	897	1,143	1,305	1,572		

Source: GFMS Platinum & Palladium Survey 2009

Top palladium producers and consumers ranked by 2008 market share

Global palladium mine production ('000 oz)

Country	2004	2005	2006	2007	2008	% Mkt.	5yrs % pa
Russia	2,841	3,133	3,164	3,049	2,712	43%	-0.1%
S Africa	2,468	2,591	2,857	2,678	2,366	37%	0.6%
N Am	1,039	930	1,024	983	908	14%	0.4%
Others	282	300	310	340	395	6%	9.3%
Global	**6,630**	**6,954**	**7,355**	**7,050**	**6,381**	**100%**	**0.7%**
Chg	7.4%	4.9%	5.8%	-4.1%	-9.5%		
US$/oz	230	201	320	355	351		

Global palladium consumption ('000 oz)

Country	2004	2005	2006	2007	2008	% Mkt.	5yrs % pa
N Am	2,204	2,331	2,350	2,421	2,180	26%	-1.2%
Japan	1,688	1,608	1,785	1,853	1,866	22%	2.6%
Europe	1,662	1,597	1,676	1,792	1,804	21%	1.2%
Others	1,759	2,228	2,349	2,471	2,549	30%	19.1%
Global	**7,313**	**7,764**	**8,160**	**8,537**	**8,399**	**100%**	**4.6%**
Chg	8.9%	6.2%	5.1%	4.6%	-1.6%		
US$/oz	230	201	320	355	351		

Source: GFMS Platinum & Palladium Survey 2009

Global uranium mine production

Top Uranium producers ranked by 2008 market share

(tonnes)	2001	2002	2003	2004	2005	2006	2007	2008	% Mkt	5yrs %pa
Canada	12,501	11,607	10,458	11,597	11,628	9,862	9,098	8,702	20%	*-3.6%*
Kazakhstan	2,115	2,727	2,952	3,719	4,346	5,279	6,638	8,521	20%	*23.6%*
Australia	7,720	7,211	7,603	9,007	9,559	7,606	8,603	8,471	20%	*2.2%*
Russia	2,500	2,900	3,073	3,280	3,325	3,200	3,413	3,521	8%	*2.8%*
Namibia	2,239	2,333	2,036	3,038	3,147	3,067	2,583	3,499	8%	*11.4%*
Niger	2,919	3,100	3,143	3,282	2,931	3,434	3,154	3,032	7%	*-0.7%*
Uzbekistan	1,962	1,860	1,770	2,016	2,020	2,260	2,320	2,300	5%	*5.4%*
USA	1,015	902	769	878	1,034	1,579	1,744	1,509	4%	*14.4%*
Ukraine	750	800	800	800	800	800	800	800	2%	*0.0%*
China	655	730	750	760	760	760	750	750	2%	*0.0%*
Others	1,970	2,197	1,905	2,023	1,937	1,480	1,625	1,581	4%	*-3.7%*
Global Total	**36,346**	**36,367**	**35,259**	**40,400**	**41,487**	**39,327**	**40,728**	**42,686**	**100%**	***3.9%***
yoy change	*4.5%*	*0.1%*	*-3.0%*	*14.6%*	*2.7%*	*-5.2%*	*3.6%*	*4.8%*		

Source: Monthly Bulletin of the World Bureau of Metal Statistics – Yearbook 2009

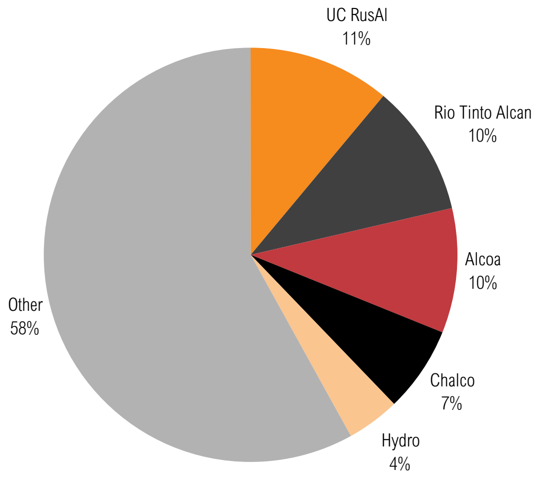
Top 10 metal-producing companies

Top 10 aluminium production companies ranked by 2008 global market share

Rank	Company	'000t	Market share	Cumulative share
1	UC RusAl	4,478	11%	11%
2	Rio Tinto Alcan	4,056	10%	21%
3	Alcoa	3,994	10%	31%
4	Chalco	2,643	7%	38%
5	Hydro	1,684	4%	42%
6	BHP Billiton	1,242	3%	45%
7	Dubal	899	2%	47%
8	Aluminium Bahrain	866	2%	49%
9	Century	800	2%	51%
10	China Power	747	2%	53%
	Others	18,723	47%	100%
	World smelter production	**40,131**	**100%**	

Source: CRU

Top five aluminium-producing companies ranked by 2008 global market share



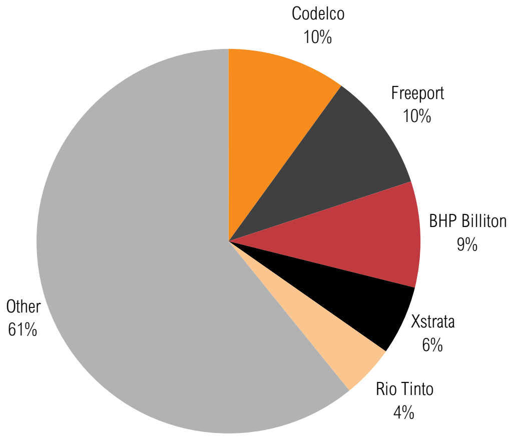
Source: CRU

Top 10 copper mine production companies ranked by 2008 global market share

Rank	Company	'000t	Market share	Cumulative share
1	Codelco	1,570	10%	10%
2	Freeport	1,549	10%	20%
3	BHP Billiton	1,360	9%	29%
4	Xstrata	915	6%	35%
5	Rio Tinto	689	4%	39%
6	Anglo American	664	4%	43%
7	SCC	457	3%	46%
8	Norilsk	437	3%	49%
9	KGHM	429	3%	52%
10	Kazakhmys	364	2%	54%
	Others	7,099	46%	100%
	World mine production	**15,553**	**100%**	

Source: CRU

Top five copper mine production companies ranked by 2008 global market share



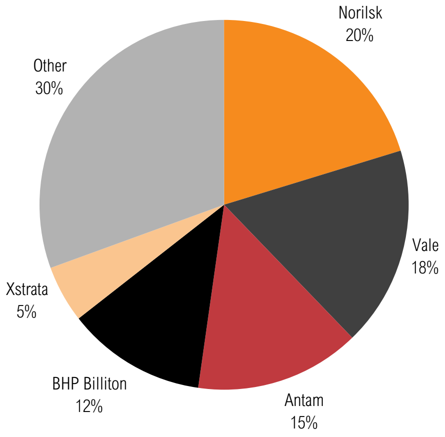
Source: CRU

Top 10 nickel mine production companies ranked by 2008 global market share

Rank	Company	'000t	Market share	Cumulative share
1	Norilsk	294	20%	20%
2	Vale	254	18%	38%
3	Antam	211	15%	52%
4	BHP Billiton	177	12%	64%
5	Xstrata	75	5%	70%
6	Cubaniquel	59	4%	74%
7	JNMC	59	4%	78%
8	Eramet	53	4%	81%
9	SMSP	34	2%	84%
10	Minara	32	2%	86%
	Other	204	14%	100%
	World mine production	1,452	100%	

Source: CRU

Top five nickel mine production companies ranked by 2008 global market share



Source: CRU

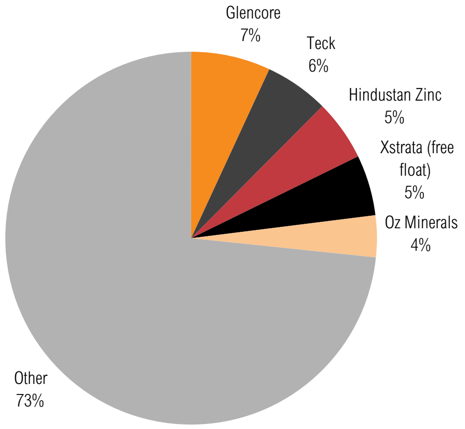
Top 10 metal-producing companies

Top 10 zinc mine production companies ranked by 2008 global market share

Rank	Company	'000t	Market share	Cumulative share
1	Glencore	794	7%	7%
2	Teck	663	6%	13%
3	Hindustan Zinc	615	5%	18%
4	Xstrata (free float)	586	5%	23%
5	Oz Minerals	423	4%	27%
6	Volcan	353	3%	30%
7	Anglo American	339	3%	33%
8	Zinifex	298	3%	35%
9	Boliden	297	3%	38%
10	Votorantim	215	2%	40%
	Others	7,003	60%	100%
	World mine production	**11,586**	**100%**	

Source: CRU

Top five zinc mine production companies ranked by 2008 global market share



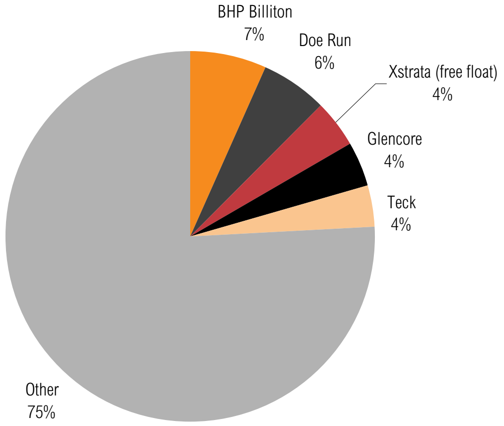
Source: CRU

Top 10 lead mine production companies ranked by 2008 global market share

Rank	Company	'000t	Market share	Cumulative share
1	BHP Billiton	257	7%	7%
2	Doe Run	225	6%	13%
3	Xstrata (free float)	152	4%	17%
4	Glencore	151	4%	20%
5	Teck	137	4%	24%
6	Volcan	106	3%	27%
7	Hindustan Zinc	83	2%	29%
8	Apex Silver	70	2%	31%
9	Oz Minerals	63	2%	32%
10	Penoles	55	1%	34%
	Others	2,540	66%	100%
	World mine production	**3,835**	**100%**	

Source: CRU

Top five lead mine production companies ranked by 2008 global market share



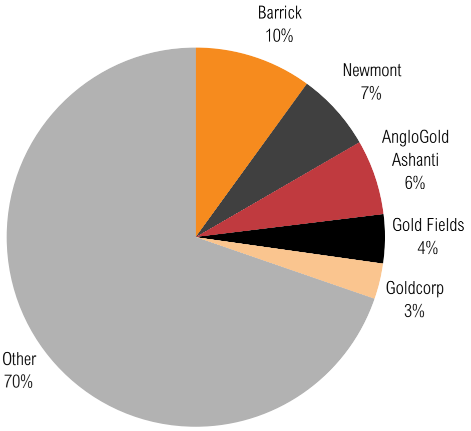
Source: CRU

Top 10 gold mine production companies ranked by 2008 global market share

Rank	Company	tonnes	Market share	Cumulative share
1	Barrick	238	10%	10%
2	Newmont	162	7%	17%
3	AngloGold Ashanti	155	6%	23%
4	Gold Fields	104	4%	27%
5	Goldcorp	72	3%	30%
6	Navoi MMC	61	3%	33%
7	Newcrest	55	2%	35%
8	Kinross	52	2%	37%
9	Harmony	51	2%	39%
10	Polyus	38	2%	41%
	Other	1,426	59%	100%
	World mine production	**2,414**	**100%**	

Source: GFMS

Top five gold mine production companies ranked by 2008 global market share



Source: GFMS

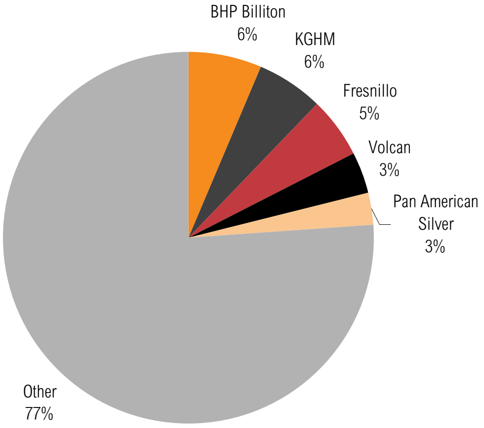
Top 10 metal-producing companies

Top 10 silver mine production companies ranked by 2008 global market share

Rank	Company	tonnes	Market share	Cumulative share
1	BHP Billiton	1,360	6%	6%
2	KGHM	1,235	6%	12%
3	Fresnillo	1,119	5%	18%
4	Volcan	739	3%	21%
5	Pan American Silver	601	3%	24%
6	Buenaventura	563	3%	27%
7	Polymetal	553	3%	29%
8	Hochschild	543	3%	32%
9	Kazakhmys	502	2%	34%
10	Southern Copper	395	2%	36%
	Others	13,569	64%	100%
	World mine production	**21,179**	**100%**	

Source: GFMS

Top five silver mine production companies ranked by 2008 global market share



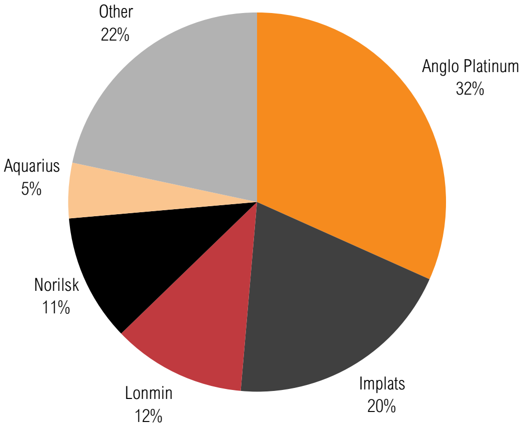
Source: GFMS

Top 10 platinum mine production companies ranked by 2008 global market share

Rank	Company	’000 oz	Market share	Cumulative share
1	Anglo Platinum	1,947	32%	32%
2	Implats	1,214	20%	51%
3	Lonmin	708	12%	63%
4	Norilsk	659	11%	74%
5	Aquarius	283	5%	78%
6	Northam	175	3%	81%
7	Vale Inco	166	3%	84%
8	Xstrata	164	3%	86%
9	Artel Amur	122	2%	88%
10	Stillwater	115	2%	90%
	Others	598	10%	100%
	World mine production	**6,151**	**100%**	

Source: GFMS

Top five platinum mine production companies ranked by 2008 global market share



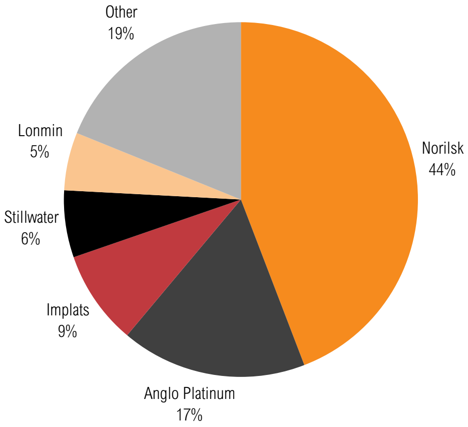
Source: GFMS

Top 10 palladium mine production companies ranked by 2008 global market share

Rank	Company	’000 oz	Market share	Cumulative share
1	Norilsk	2,821	44%	44%
2	Anglo Platinum	1,071	17%	61%
3	Implats	560	9%	70%
4	Stillwater	384	6%	76%
5	Lonmin	331	5%	81%
6	Vale Inco	231	4%	85%
7	N. American Palladium	212	3%	88%
8	Aquarius	148	2%	90%
9	Xstrata	123	2%	92%
10	ARM Platinum	101	2%	94%
	Others	399	6%	100%
	World mine production	**6,381**	**100%**	

Source: GFMS

Top five palladium mine production companies ranked by 2008 global market share



Source: GFMS

Global refined base metals production

30-year annual global refined base metals production ('000 tonnes)

Year	IMF world GDP yoy (%)	yoy change (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1978	4.6	0.2	14,776	9,232	5,497	6,038	622	236
1979	3.8	-0.8	15,175	9,367	5,659	6,456	673	244
1980	2.0	-1.8	16,035	9,268	5,454	6,133	742	245
1981	2.2	0.2	15,698	9,577	5,346	6,127	704	244
1982	0.9	-1.3	13,990	9,440	5,247	5,855	630	208
1983	2.8	1.9	14,334	9,694	5,235	6,124	680	227
1984	4.6	1.8	15,941	9,512	5,336	6,377	747	225
1985	3.6	-1.0	15,555	9,689	5,411	6,480	775	217
1986	3.5	-0.1	15,619	9,862	5,273	6,390	767	209
1987	3.7	0.2	16,483	10,160	5,470	6,627	806	207
1988	4.5	0.8	18,575	10,485	5,644	6,856	851	227
1989	3.7	-0.8	19,135	10,858	5,705	6,784	857	243
1990	2.9	-0.8	19,348	10,809	5,473	6,746	858	248
1991	1.5	-1.5	19,653	10,688	5,383	6,895	842	223
1992	2.0	0.6	19,459	11,170	5,484	7,035	872	206
1993	2.0	0.0	19,715	11,306	5,479	7,182	797	217
1994	3.4	1.4	19,112	11,166	5,455	7,123	832	222
1995	3.3	-0.1	19,658	11,829	5,761	7,362	916	216
1996	3.7	0.5	20,846	12,756	5,838	7,464	958	228
1997	4.0	0.3	21,798	13,605	6,029	7,802	1,014	238
1998	2.5	-1.5	22,654	14,120	6,020	8,042	1,042	241
1999	3.5	1.0	23,707	14,465	6,289	8,395	1,037	247
2000	4.7	1.2	24,418	14,816	6,665	9,021	1,109	264
2001	2.2	-2.5	24,436	15,675	6,585	9,272	1,157	270
2002	2.8	0.6	26,076	15,350	6,670	9,754	1,187	266
2003	3.6	0.8	28,001	15,273	6,787	9,912	1,211	276
2004	4.9	1.3	29,936	15,928	6,998	10,392	1,251	343
2005	4.5	-0.5	32,017	16,573	7,623	10,222	1,288	350
2006	5.1	0.6	33,975	17,295	7,924	10,655	1,336	351
2007	5.0	-0.1	38,108	17,944	8,117	11,360	1,447	349
2008	2.7	-2.3	39,258	18,232	8,671	11,655	1,354	333

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Compound annual growth rate of global refined base metal production over varying periods

	Av IMF world GDP yoy (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-1990	3.2	1.9%	1.6%	0.0%	1.0%	1.5%	0.1%
1990-2000	2.9	2.4%	3.2%	2.0%	2.9%	2.6%	0.6%
2000-2008	4.1	6.1%	2.6%	3.3%	3.3%	2.5%	2.9%
1978-2008	3.4	3.3%	2.3%	1.5%	2.2%	2.6%	1.2%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Annual changes in global refined base metals production

30-year annual percentage changes in global refined base metal production

Year	IMF world GDP yoy (%)	yoy change (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1979	3.8	-0.8	2.7%	1.5%	2.9%	6.9%	8.2%	3.5%
1980	2.0	-1.8	5.7%	-1.1%	-3.6%	-5.0%	10.3%	0.3%
1981	2.2	0.2	-2.1%	3.3%	-2.0%	-0.1%	-5.1%	-0.4%
1982	0.9	-1.3	-10.9%	-1.4%	-1.9%	-4.4%	-10.5%	-14.8%
1983	2.8	1.9	2.5%	2.7%	-0.2%	4.6%	7.9%	8.9%
1984	4.6	1.8	11.2%	-1.9%	1.9%	4.1%	9.9%	-0.6%
1985	3.6	-1.0	-2.4%	1.9%	1.4%	1.6%	3.7%	-3.5%
1986	3.5	-0.1	0.4%	1.8%	-2.6%	-1.4%	-1.0%	-3.8%
1987	3.7	0.2	5.5%	3.0%	3.7%	3.7%	5.0%	-1.1%
1988	4.5	0.8	12.7%	3.2%	3.2%	3.5%	5.6%	9.9%
1989	3.7	-0.8	3.0%	3.6%	1.1%	-2.1%	0.7%	6.7%
1990	2.9	-0.8	1.1%	-0.5%	-4.1%	-1.4%	0.1%	2.1%
1991	1.5	-1.5	1.6%	-1.1%	-1.6%	0.3%	-1.8%	-10.1%
1992	2.0	0.6	-1.0%	4.5%	1.9%	-0.7%	3.6%	-7.3%
1993	2.0	0.0	1.3%	1.2%	-0.1%	0.2%	-8.6%	4.9%
1994	3.4	1.4	-3.1%	-1.2%	-0.4%	5.3%	4.4%	2.3%
1995	3.3	-0.1	2.9%	5.9%	5.6%	8.0%	10.2%	-2.4%
1996	3.7	0.5	6.0%	7.8%	1.3%	0.4%	4.6%	5.3%
1997	4.0	0.3	4.6%	6.7%	3.3%	3.6%	5.8%	4.6%
1998	2.5	-1.5	3.9%	3.8%	-0.1%	2.6%	2.7%	1.3%
1999	3.5	1.0	4.6%	2.4%	4.5%	6.8%	-0.4%	2.2%
2000	4.7	1.2	3.0%	2.4%	6.0%	7.5%	6.9%	6.9%
2001	2.2	-2.5	0.1%	5.8%	-1.2%	2.8%	4.3%	2.5%
2002	2.8	0.6	6.7%	-2.1%	1.3%	5.0%	2.5%	-1.4%
2003	3.6	0.8	7.4%	-0.5%	1.8%	1.6%	2.1%	3.8%
2004	4.9	1.3	6.9%	4.3%	3.1%	4.8%	3.3%	24.1%
2005	4.5	-0.5	7.0%	4.0%	9.2%	-1.6%	2.9%	2.0%
2006	5.1	0.6	6.1%	4.4%	3.9%	4.2%	3.7%	0.3%
2007	5.0	-0.1	12.2%	3.8%	2.4%	6.6%	8.3%	-0.6%
2008	2.7	-2.3	3.0%	1.6%	6.8%	2.6%	-6.4%	-4.6%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Percentage changes in annual global refined base metals production over varying periods

	Av IMF world GDP yoy (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-1990	3.2	20.7%	16.6%	0.3%	10.0%	15.5%	1.2%
1990-2000	2.9	26.2%	37.1%	21.8%	33.7%	29.4%	6.4%
2000-2008	4.1	60.8%	23.1%	30.1%	29.2%	22.0%	26.3%
1978-2007	3.4	165.7%	97.5%	57.7%	93.0%	117.8%	41.2%

Source: IMF, World Bureau of Metal Statistics ILZSG, ICSG

Global refined base metals consumption

30-year annual global refined base metals consumption ('000 tonnes)

Year	IMF world GDP yoy (%)	yoy change (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1978	4.6	0.2	15,329	9,530	5,583	6,328	697	232
1979	3.8	-0.8	15,981	9,830	5,646	6,437	750	237
1980	2.0	-1.8	15,298	9,375	5,429	6,242	717	224
1981	2.2	0.2	14,516	9,525	5,345	6,116	662	213
1982	0.9	-1.3	14,161	9,019	5,179	5,902	650	199
1983	2.8	1.9	15,361	9,099	5,189	6,181	689	208
1984	4.6	1.8	15,574	9,914	5,312	6,350	780	221
1985	3.6	-1.0	15,862	9,665	5,315	6,347	788	215
1986	3.5	-0.1	16,071	10,070	5,380	6,547	776	223
1987	3.7	0.2	17,053	10,449	5,464	6,722	838	229
1988	4.5	0.8	18,867	10,531	5,527	6,848	857	233
1989	3.7	-0.8	19,244	10,969	5,562	6,715	848	232
1990	2.9	-0.8	19,226	10,780	5,403	6,620	842	239
1991	1.5	-1.5	18,743	10,695	5,328	6,642	799	209
1992	2.0	0.6	18,558	10,801	5,290	6,597	799	224
1993	2.0	0.0	18,166	10,972	5,203	6,609	824	239
1994	3.4	1.4	19,762	11,639	5,489	6,960	910	241
1995	3.3	-0.1	20,555	12,150	5,802	7,519	998	240
1996	3.7	0.5	20,684	12,399	5,975	7,551	904	239
1997	4.0	0.3	21,870	13,017	6,053	7,822	990	245
1998	2.5	-1.5	21,889	13,353	6,065	8,033	992	243
1999	3.5	1.0	23,356	14,057	6,242	8,575	1,057	250
2000	4.7	1.2	25,059	15,192	6,515	9,007	1,172	278
2001	2.2	-2.5	23,722	14,686	6,480	8,928	1,138	282
2002	2.8	0.6	25,372	15,051	6,635	9,385	1,186	276
2003	3.6	0.8	27,606	15,716	6,844	9,839	1,249	302
2004	4.9	1.3	29,965	16,840	7,296	10,647	1,251	334
2005	4.5	-0.5	31,689	16,673	7,786	10,611	1,296	345
2006	5.1	0.6	33,954	17,043	8,063	11,016	1,366	363
2007	5.0	-0.1	37,561	18,676	8,182	11,307	1,354	356
2008	2.7	-2.3	37,009	18,006	8,665	11,438	1,297	337

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Compound annual growth rate of global refined base metal consumption over varying periods

	Av IMF world GDP yoy %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-1990	3.2	2.3%	1.4%	0.0%	0.6%	1.6%	0.6%
1990-2000	3.1	2.7%	3.5%	1.9%	3.1%	3.4%	1.5%
2000-2008	4.1	5.0%	2.1%	3.6%	3.1%	1.3%	2.4%
1978-2008	3.4	3.0%	2.1%	1.5%	2.0%	2.1%	1.3%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Annual changes in global refined base metals consumption

30-year annual percentage changes in global refined base metals consumption

Year	IMF world GDP yoy (%)	yoy change (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1979	3.8	-0.8	4.3%	3.1%	1.1%	1.7%	7.6%	2.3%
1980	2.0	-1.8	-4.3%	-4.6%	-3.8%	-3.0%	-4.5%	-5.4%
1981	2.2	0.2	-5.1%	1.6%	-1.5%	-2.0%	-7.6%	-4.9%
1982	0.9	-1.3	-2.4%	-5.3%	-3.1%	-3.5%	-1.9%	-6.6%
1983	2.8	1.9	8.5%	0.9%	0.2%	4.7%	6.0%	4.2%
1984	4.6	1.8	1.4%	9.0%	2.4%	2.7%	13.3%	6.6%
1985	3.6	-1.0	1.8%	-2.5%	0.1%	0.0%	1.0%	-2.9%
1986	3.5	-0.1	1.3%	4.2%	1.2%	3.2%	-1.6%	3.8%
1987	3.7	0.2	6.1%	3.8%	1.6%	2.7%	8.0%	2.9%
1988	4.5	0.8	10.6%	0.8%	1.2%	1.9%	2.3%	1.5%
1989	3.7	-0.8	2.0%	4.2%	0.6%	-1.9%	-1.1%	-0.3%
1990	2.9	-0.8	-0.1%	-1.7%	-2.9%	-1.4%	-0.6%	2.9%
1991	1.5	-1.5	-2.5%	-0.8%	-1.4%	0.3%	-5.2%	-12.6%
1992	2.0	0.6	-1.0%	1.0%	-0.7%	-0.7%	0.1%	7.4%
1993	2.0	0.0	-2.1%	1.6%	-1.6%	0.2%	3.1%	6.6%
1994	3.4	1.4	8.8%	6.1%	5.5%	5.3%	10.4%	0.7%
1995	3.3	-0.1	4.0%	4.4%	5.7%	8.0%	9.7%	-0.2%
1996	3.7	0.5	0.6%	2.0%	3.0%	0.4%	-9.4%	-0.5%
1997	4.0	0.3	5.7%	5.0%	1.3%	3.6%	9.6%	2.4%
1998	2.5	-1.5	0.1%	2.6%	0.2%	2.6%	0.2%	-0.8%
1999	3.5	1.0	6.7%	5.3%	2.9%	6.8%	6.5%	3.1%
2000	4.7	1.2	7.3%	8.1%	4.4%	5.0%	10.9%	11.3%
2001	2.2	-2.5	-5.3%	-3.3%	-0.5%	-0.9%	-2.9%	1.5%
2002	2.8	0.6	7.0%	2.5%	2.4%	5.1%	4.3%	-2.4%
2003	3.6	0.8	8.8%	4.4%	3.1%	4.8%	5.3%	9.5%
2004	4.9	1.3	8.5%	7.2%	6.6%	8.2%	0.2%	10.7%
2005	4.5	-0.5	5.8%	-1.0%	6.7%	-0.3%	3.6%	3.3%
2006	5.1	0.6	7.1%	2.2%	3.6%	3.8%	5.4%	5.2%
2007	5.0	-0.1	10.6%	9.6%	1.5%	2.6%	-0.9%	-1.9%
2008	2.7	-2.3	-1.5%	-3.6%	5.9%	1.2%	-4.2%	-5.3%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Percentage changes in annual global refined base metals consumption over varying periods

	Av IMF world GDP yoy (%)	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-1990	3.2	25.7%	15.0%	-0.5%	6.1%	17.5%	6.6%
1990-2000	3.1	30.3%	40.9%	20.6%	36.1%	39.2%	16.6%
2000-2008	4.1	47.7%	18.5%	33.0%	27.0%	10.7%	21.1%
1978-2008	3.4	141.4%	88.9%	55.2%	80.8%	86.0%	45.6%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Summary of global precious metals mine production and consumption

Global precious metals mine production (2000-08)

	Precious metals mine production (tonnes)				Percentage change in precious metals mine production			
Year	**Gold**	**Silver**	**Platinum**	**Palladium**	**Gold**	**Silver**	**Platinum**	**Palladium**
2000	2,618	18,381	156	165	0.63%	6.12%	-3.16%	1.79%
2001	2,645	18,856	168	173	1.01%	2.58%	7.18%	4.93%
2002	2,618	18,472	180	185	-1.02%	-2.04%	7.40%	7.24%
2003	2,621	18,557	187	192	0.11%	0.46%	4.11%	3.70%
2004	2,494	19,068	199	206	-4.84%	2.75%	6.42%	7.42%
2005	2,550	19,817	206	216	2.25%	3.93%	3.29%	4.89%
2006	2,485	19,947	218	229	-2.55%	0.66%	6.04%	5.77%
2007	2,478	20,659	205	219	-0.28%	3.57%	-6.28%	-4.15%
2008	2,414	21,178	191	198	-2.50%	2.51%	-6.56%	-9.49%
Chg, 2000-08	*-204*	*2,797*	*35*	*34*	*-8%*	*15%*	*22%*	*21%*

Source: GFMS – Gold Survey 2009, Platinum & Palladium Survey 2009, Silver Institute (GFMS) World Silver Survey 2009

Global precious metals fabrication (2000-08)

	Precious metals fabrication (tonnes)				Percentage change in precious metals fabrication			
Year	**Gold**	**Silver**	**Platinum**	**Palladium**	**Gold**	**Silver**	**Platinum**	**Palladium**
2000	3,761	27,734	197	287	0.79%	3.16%	0.59%	-2.91%
2001	3,482	26,721	216	220	-7.43%	-3.65%	9.64%	-23.47%
2002	3,141	25,733	234	205	-9.79%	-3.70%	8.36%	-6.85%
2003	2,997	26,169	238	209	-4.59%	1.69%	1.77%	2.07%
2004	3,172	25,830	242	227	5.85%	-1.30%	1.52%	8.86%
2005	3,291	26,348	243	241	3.75%	2.01%	0.58%	6.17%
2006	2,936	25,945	244	254	-10.79%	-1.53%	0.51%	5.10%
2007	3,076	26,136	248	266	4.77%	0.74%	1.40%	4.62%
2008	2,884	25,896	242	261	-7.35%	-0.92%	-2.10%	-1.62%
Chg, 2000-08	*3,761*	*27,734*	*197*	*287*	*0.79%*	*3.16%*	*0.59%*	*-2.91%*

Source: Gold Survey 2009, Platinum & Palladium Survey 2009, Silver Institute (GFMS) World Silver Survey 2009

Weights-conversion table

Imperial	**Factor**	**Metric**	**Metric**	**Factor**	**Imperial**
Troy ounces	x 31.1034	Grams	Grams	x 0.0321508	Troy ounces
Pounds – lbs	x 0.453592	Kilograms	Kilograms	x 2.2046	Pounds – lbs
Short tons	x 0.90718	Tonnes	Tonnes	x 1.102317	Short tons
Troy ounces/short tons	x 34.286	Grams per tonne	Grams per tonne	x 0.029167	Troy ounces/short tons
USc/lb	x 22.046	US$/tonne	US$/tonne	/ 22.046	USc/lb

Source: RBS

World’s top 50 central bank gold holdings (value with gold at US$1,115/oz)

Rank	Country	Gold reserves tonnes	Gold reserves moz	% of world gold reserves	Value US$bn	Gold's % of total forex reserves
1	United States	8,133.5	261.5	27.0%	291.6	68.7%
2	Germany	3,407.6	109.6	11.3%	122.2	64.6%
3	IMF	3,005.3	96.6	10.0%	107.7	na
4	Italy	2,451.8	78.8	8.1%	87.9	63.4%
5	France	2,435.4	78.3	8.1%	87.3	64.2%
6	China	1,054.0	33.9	3.5%	37.8	1.5%
7	Switzerland	1,040.1	33.4	3.5%	37.3	28.8%
8	Japan	765.2	24.6	2.5%	27.4	2.4%
9	Netherlands	612.5	19.7	2.0%	22.0	51.7%
10	Russia	607.7	19.5	2.0%	21.8	6.7%
11	India	557.7	17.9	1.9%	20.0	6.4%
12	ECB	501.4	16.1	1.7%	18.0	19.6%
13	Taiwan	423.6	13.6	1.4%	15.2	4.1%
14	Portugal	382.5	12.3	1.3%	13.7	83.8%
15	Venezuela	356.4	11.5	1.2%	12.8	35.7%
16	United Kingdom	310.3	10.0	1.0%	11.1	15.2%
17	Lebanon	286.8	9.2	1.0%	10.3	26.5%
18	Spain	281.6	9.1	0.9%	10.1	34.6%
19	Austria	280.0	9.0	0.9%	10.0	52.7%
20	Belgium	227.5	7.3	0.8%	8.2	31.8%
21	Algeria	173.6	5.6	0.6%	6.2	3.8%
22	Philippines	154.7	5.0	0.5%	5.5	12.1%
23	Libya	143.8	4.6	0.5%	5.2	4.6%
24	Saudia Arabia	143.0	4.6	0.5%	5.1	10.2%
25	Singapore	127.4	4.1	0.4%	4.6	2.3%
26	Sweden	125.7	4.0	0.4%	4.5	8.6%
27	South Africa	124.8	4.0	0.4%	4.5	10.5%
28	BIS	120.0	3.9	0.4%	4.3	na
29	Turkey	116.1	3.7	0.4%	4.2	5.2%
30	Greece	112.4	3.6	0.4%	4.0	71.5%
31	Romania	103.7	3.3	0.3%	3.7	7.4%
32	Poland	102.9	3.3	0.3%	3.7	4.4%
33	Thailand	84.0	2.7	0.3%	3.0	2.1%
34	Australia	79.9	2.6	0.3%	2.9	6.0%
35	Kuwait	79.0	2.5	0.3%	2.8	11.4%
36	Egypt	75.6	2.4	0.3%	2.7	7.4%
37	Kazakhstan	74.5	2.4	0.2%	2.7	12.0%
38	Indonesia	73.1	2.4	0.2%	2.6	3.9%
39	Denmark	66.5	2.1	0.2%	2.4	2.8%
40	Pakistan	65.4	2.1	0.2%	2.3	15.8%
41	Argentina	54.7	1.8	0.2%	2.0	3.7%
42	Finland	49.1	1.6	0.2%	1.8	15.1%
43	Bulgaria	39.9	1.3	0.1%	1.4	7.1%
44	WAEMU	36.5	1.2	0.1%	1.3	9.9%
45	Malaysia	36.4	1.2	0.1%	1.3	1.3%
46	Peru	34.7	1.1	0.1%	1.2	3.6%
47	Brazil	33.6	1.1	0.1%	1.2	0.5%
48	Slovakia	31.8	1.0	0.1%	1.14	60.3%
49	Bolivia	28.3	0.9	0.1%	1.0	11.0%
50	Belarus	28.3	0.9	0.1%	1.0	23.1%
	World	**30,117**	**968.3**	**100%**	**1079.6**	**na**
	All Countries	**26,780**	**861.0**	**88.9%**	**960.0**	**10.2%**
	CBGA (1) signatories	12,113	389.5	40.2%	434.2	46.3%
	CBGA (2) signatories	11,933	383.7	39.6%	427.8	48.9%

Source: World Gold Council, RBS

30-year average annual nominal spot base metals prices

Year	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1978	1,045	47.4	1,365	61.9	658	29.8	592	26.9	4,145	1.88	12,500	5.67
1979	1,532	69.5	1,984	90.0	1,202	54.5	742	33.7	5,600	2.54	14,815	6.72
1980	1,753	79.5	2,194	99.5	904	41.0	761	34.5	6,526	2.96	16,402	7.44
1981	1,268	57.5	1,746	79.2	728	33.0	861	39.1	6,063	2.75	14,021	6.36
1982	995	45.1	1,482	67.2	545	24.7	744	33.7	4,850	2.20	12,941	5.87
1983	1,437	65.2	1,592	72.2	425	19.3	767	34.8	4,674	2.12	13,007	5.90
1984	1,251	56.7	1,380	62.6	442	20.0	891	40.4	4,762	2.16	12,456	5.65
1985	1,041	47.2	1,413	64.1	390	17.7	799	36.2	4,916	2.23	11,464	5.20
1986	1,150	52.2	1,374	62.3	406	18.4	757	34.3	3,880	1.76	6,173	2.80
1987	1,565	71.0	1,781	80.8	596	27.0	799	36.2	4,872	2.21	6,724	3.05
1988	2,530	114.8	2,606	118.2	655	29.7	1,247	56.6	13,823	6.27	7,165	3.25
1989	1,951	88.5	2,859	129.7	672	30.5	1,656	75.1	13,338	6.05	8,598	3.90
1990	1,639	74.3	2,670	121.1	813	36.9	1,520	68.9	9,083	4.12	6,195	2.81
1991	1,302	59.1	2,337	106.0	557	25.3	1,116	50.6	8,157	3.70	5,556	2.52
1992	1,254	56.9	2,266	102.8	542	24.6	1,240	56.2	7,011	3.18	6,107	2.77
1993	1,139	51.7	1,913	86.8	406	18.4	961	43.6	5,291	2.40	5,159	2.34
1994	1,479	67.1	2,313	104.9	548	24.9	998	45.3	6,349	2.88	5,467	2.48
1995	1,805	81.9	2,937	133.2	631	28.6	1,031	46.8	8,223	3.73	6,217	2.82
1996	1,504	68.2	2,291	103.9	774	35.1	1,025	46.5	7,496	3.40	6,173	2.80
1997	1,598	72.5	2,278	103.3	624	28.3	1,318	59.8	6,922	3.14	6,164	2.80
1998	1,356	61.6	1,653	75.0	528	23.9	1,023	46.4	4,614	2.10	5,537	2.51
1999	1,362	61.8	1,573	71.4	502	22.8	1,077	48.9	6,023	2.73	5,398	2.45
2000	1,549	70.3	1,814	82.3	454	20.6	1,128	51.2	8,637	3.92	5,432	2.46
2001	1,444	65.5	1,577	71.6	476	21.6	886	40.2	5,945	2.70	4,480	2.03
2002	1,349	61.2	1,558	70.6	452	20.5	778	35.3	6,768	3.07	4,059	1.84
2003	1,431	64.9	1,780	80.7	515	23.4	828	37.6	9,636	4.37	4,893	2.22
2004	1,716	77.8	2,868	130.1	888	40.3	1,047	47.5	13,845	6.28	8,504	3.86
2005	1,897	86.0	3,683	167.1	975	44.2	1,381	62.7	14,727	6.69	7,365	3.34
2006	2,566	116.5	6,729	305.3	1,287	58.4	3,272	148.5	24,276	10.99	8,755	3.97
2007	2,638	119.7	7,125	323.3	2,594	117.7	3,249	147.4	37,167	16.89	14,526	6.59
2008	2,571	116.6	6,951	315.3	2,084	94.5	1,870	84.8	21,020	9.53	18,487	8.39

Source: LME, CRU, ILZSG

Average annual nominal spot base metals prices over varying periods

Period	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1980-1989	1,494	67.8	1,843	83.6	576	26.1	928	42.1	6,770	3.07	10,895	4.94
1990-1999	1,444	65.5	2,223	100.8	593	26.9	1,131	51.3	6,918	3.14	5,798	2.63
2000-2008	1,907	86.5	3,787	171.8	1,081	49.0	1,604	72.8	15,780	7.16	8,500	3.86
1979-2008	1,602	72.7	2,558	116.0	754	34.2	1,192	54.1	9,483	4.30	8,608	3.90

Source: LME, CRU ILZSG

30-year average annual real spot base metals prices (US CPI deflator 2008 = 1)

Year	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1978	2,736	124	3,573	162	1,723	78	1550	70	10,852	4.92	32,729	14.85
1979	3,705	168	4,798	218	2,906	132	1794	81	13,540	6.14	35,823	16.25
1980	3,884	176	4,862	221	2,004	91	1687	77	14,463	6.56	36,353	16.49
1981	2,570	117	3,538	160	1,475	67	1745	79	12,286	5.57	28,413	12.89
1982	1,900	86	2,829	128	1,041	47	1421	64	9,263	4.20	24,715	11.21
1983	2,640	120	2,924	133	781	35	1409	64	8,587	3.90	23,898	10.84
1984	2,215	100	2,444	111	783	36	1578	72	8,432	3.82	22,057	10.00
1985	1,789	81	2,429	110	670	30	1373	62	8,448	3.83	19,700	8.94
1986	1,933	88	2,309	105	683	31	1273	58	6,523	2.96	10,378	4.71
1987	2,562	116	2,916	132	976	44	1308	59	7,975	3.62	11,006	4.99
1988	4,004	182	4,124	187	1,037	47	1974	90	21,877	9.92	11,340	5.14
1989	2,975	135	4,361	198	1,025	46	2525	115	20,340	9.23	13,112	5.95
1990	2,406	109	3,920	178	1,194	54	2232	101	13,335	6.05	9,095	4.13
1991	1,847	84	3,315	150	790	36	1583	72	11,572	5.25	7,882	3.58
1992	1,739	79	3,143	143	752	34	1720	78	9,722	4.41	8,469	3.84
1993	1,544	70	2,593	118	550	25	1303	59	7,172	3.25	6,993	3.17
1994	1,963	89	3,070	139	727	33	1325	60	8,428	3.82	7,257	3.29
1995	2,348	106	3,821	173	821	37	1341	61	10,696	4.85	8,087	3.67
1996	1,920	87	2,924	133	988	45	1308	59	9,569	4.34	7,880	3.57
1997	2,007	91	2,860	130	784	36	1655	75	8,693	3.94	7,741	3.51
1998	1,684	76	2,053	93	656	30	1271	58	5,731	2.61	6,877	3.12
1999	1,667	76	1,926	87	615	28	1319	60	7,374	3.34	6,608	3.00
2000	1,856	84	2,174	99	544	25	1352	61	10,349	4.70	6,508	2.95
2001	1,690	77	1,846	84	557	25	1037	47	6,956	3.16	5,242	2.38
2002	1,551	70	1,791	81	520	24	895	41	7,783	3.53	4,668	2.12
2003	1,611	73	2,004	91	580	26	932	42	10,851	4.92	5,510	2.50
2004	1,878	85	3,139	142	972	44	1146	52	15,155	6.87	9,309	4.22
2005	2,011	91	3,904	177	1,033	47	1464	66	15,610	7.09	7,806	3.54
2006	2,635	120	6,911	314	1,322	60	3360	152	24,930	11.29	8,990	4.08
2007	2,638	120	7,125	323	2,594	118	3249	147	37,167	16.89	14,526	6.59
2008	2,571	117	6,951	315	2,084	95	1,870	85	21,020	9.53	18,487	8.39

Source: LME, CRU, ILZSG, IMF

Average annual real spot base metals prices over varying periods (US CPI deflator 2008 = 1)

Period	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1980-1989	2,647	120.1	3,274	148.5	1,047	47.5	1,629	73.9	11,819	5.36	20,097	9.12
1990-1999	1,913	86.8	2,963	134.4	788	35.7	1,506	68.3	9,229	4.19	7,689	3.49
2000-2008	2,049	93.0	3,983	180.7	1,134	51.5	1,701	77.2	16,647	7.55	9,005	4.08
1979-2008	2,258	102.4	3,433	155.7	1,049	47.6	1,615	73.3	12,462	5.65	13,158	5.97

Source: LME, CRU, ILZSG, IMF

30-year average annual nominal and real spot precious metals prices

	Nominal precious metals spot prices, US$/oz				Real precious metals spot prices, US$/oz (US CPI deflator 2008 = 1)			
Year	Gold	Silver	Platinum	Palladium	Gold	Silver	Platinum	Palladium
1978	194	5.42	260	63.0	507	14.2	680	165
1979	305	11.07	448	120	737	26.8	1,083	290
1980	615	20.98	662	201	1,362	46.5	1,467	445
1981	459	10.49	446	95	931	21.3	905	193
1982	375	7.92	328	67	717	15.1	627	128
1983	424	11.43	425	136	778	21.0	780	250
1984	361	8.15	357	148	639	14.4	633	262
1985	317	6.13	293	107	545	10.5	504	184
1986	368	5.47	467	116	618	9.2	785	195
1987	446	7.02	557	130	730	11.5	911	213
1988	437	6.53	530	123	691	10.3	839	195
1989	231	5.50	510	144	352	8.4	777	220
1990	384	4.83	472	114	563	7.1	693	167
1991	362	4.06	376	90	514	5.8	534	128
1992	344	3.95	360	85	477	5.5	499	118
1993	360	4.31	374	115	488	5.8	507	156
1994	384	5.29	405	136	510	7.0	538	181
1995	384	5.20	424	156	499	6.8	552	203
1996	388	5.20	397	128	495	6.6	507	163
1997	331	4.90	395	178	416	6.1	496	224
1998	294	5.53	372	284	365	6.87	462	353
1999	279	5.22	377	358	341	6.39	462	438
2000	279	4.95	545	683	334	5.93	653	818
2001	271	4.37	529	602	317	5.11	619	705
2002	310	4.60	540	337	356	5.29	621	388
2003	363	4.88	692	200	409	5.49	779	226
2004	409	6.66	846	230	448	7.29	926	252
2005	445	7.31	897	201	472	7.75	951	214
2006	604	11.55	1,142	320	620	11.86	1,173	329
2007	696	13.38	1,305	355	696	13.38	1,305	355
2008	872	14.99	1,572	351	872	14.99	1,572	351

Source: LBMA, LPPM, Johnson Matthey, GFMS

Average annual nominal and real spot precious metals prices over varying periods

	Nominal precious metals spot prices, US$/oz				Real precious metals spot prices, US$/oz (US CPI deflator 2008 = 1)			
Period	Gold	Silver	Platinum	Palladium	Gold	Silver	Platinum	Palladium
1980-1989	403	8.96	458	127	736	16.82	823	228
1990-1999	351	4.85	395	164	467	6.40	525	213
2000-2008	472	8.08	896	364	503	8.57	955	404
1979-2008	403	7.39	568	210	576	11.20	772	278

Source: LBMA, LPPM, Johnson Matthey, GFMS

Selected glossary of useful mining industry websites

Resource company websites

Resource company	Key business area	Website address
Alcoa	Aluminium	www.alcoa.com
Alumina Limited	Alumina	www.aluminalimited.com
Anglo American	Diversified miner	www.angloamerican.co.uk
Anglo Platinum	Platinum	www.angloplatinum.com
Anglogold	Gold	www.anglogold.com
Antofagasta	Copper	www.antofagasta.co.uk
ArcelorMittal	Steel	www.arcelormittal.com
Arch Coal	Coal	www.archcoal.com
Ashanti	Gold	www.ashantigold.com
Baoshan Steel	Steel	www.baosteel.com
Barrick Gold	Gold	www.barrick.com
BHP Billiton	Diversified miner	www.bhpbilliton.com
Boliden AB	Diversified miner	www.boliden.com
Buenaventura	Diversified miner	www.buenaventura.com
Cameco Corp	Uranium	www.cameco.com
Centennial Coal	Coal	www.centennialcoal.com.au
Codelco	Copper	www.codelco.com
Consol	Coal	www.consolenergy.com
Cumerio	Copper	www.cumerio.com
Durban Deep	Gold	www.drd.co.za
Eramet	Nickel	www.eramet.fr
Freeport McMoRan Copper & Gold	Copper and gold	www.fcx.com
Fresnillo	Silver – gold	www.fresnilloplc.com
Gold Fields Ltd	Gold	www.goldfields.co.za
GoldCorp	Gold	www.goldcorp.com
Grupo Mexico	Copper	www.grupomexico.com
Harmony	Gold	www.harmonygold.com
Hindalco	Aluminium	www.hindalco.com
Iluka	Titanium	www.iluka.com
Impala Platinum	Platinum	www.implats.co.za
Ivernia	Lead	www.ivernia.com
Jiangxi Copper	Copper	www.jxcn.cn/english
Johnson Matthey	Precious metals	www.matthey.com
KGHM	Copper	www.polishcopper.com
Kinross Gold	Gold	www.kinross.com
Korea Zinc	Zinc	www.koreazinc.co.kr
Kumba Resources	Diversified miner	www.kumbaresources.com
Lihir	Gold	www.lihir.com.pg
Lonmin	Platinum and gold	www.lonmin.com
Macarthur Coal	Coal	www.macarthurcoal.com.au
Meridian Gold	Gold	www.meridiangold.com
Minara Nickel	Nickel	www.minara.com.au
Nalco	Aluminium	www.nalco.com
Newcrest	Gold	www.newcrest.com.au
Newmont	Gold	www.newmont.com
Nippon Steel Corp	Steel	www.nsc.co.jp
Norilsk Nickel	Nickel, copper and PGM	www.nornik.ru
Northam	Platinum	www.northam.co.za
Nucor	Steel	www.nucor.com
Outokumpu	Stainless steel	www.outokumpu.com
OZ Minerals	Copper, gold	www.ozminerals.com
Peabody	Coal	www.peabodyenergy.com

Penoles	Lead-zinc, silver miner	www.penoles.com.mx
Petropavlovsk	Gold	www.petopavlovsk.net
Posco	Steel	www.posco.co.kr
Rio Tinto	Diversified miner	www.riotinto.com
Rusal	Aluminium	www.rusal.com
Sterlite	Copper	www.sterlite.com
Stillwater	Palladium	www.stillwatermining.com
Teck	Lead-zinc	www.teck.com
ThyssenKrupp	Steel	www.thyssenkrupp.com
Umicore	Zinc, copper	www.umicore.com
Vale	Diversified miner	www.vale.com
Vedanta Resources	Copper, aluminium and zinc	www.vedantaresources.com
Xstrata	Diversified	www.xstrata.com

Source: Company data, RBS

Websites with useful industry statistics

Basemetals.com	Newswire	www.basemetals.com
China Daily	Newswire	www.chinadaily.com.cn
China.org.cn	China customs and other data	www.china.org.cn
Cobalt News	Cobalt Institute	www.cobaltdevinstitute.com
Copper Development Association (UK)	Copper research and statistics	www.copperinfo.co.uk
Copper Development Association (US)	Copper research and statistics	www.copper.org
GFMS	Precious and base metals research	www.gfms.co.uk
Gold Institute	Gold	www.goldinstitute.net
IAI	Aluminium statistics	www.world-aluminium.org
International Copper Study Group	Copper statistics	www.icsg.org
International Lead-Zinc Study Group	Lead and zinc statistics	www.ilzsg.org
International Nickel Study Group	Nickel industry statistics	www.insg.org
International Wrought Copper Council	Copper research and statistics	www.coppercouncil.org
ITRI	Tin research and statistics	www.itri.co.uk
Johnson Matthey	Platinum industry statistics	www.platinum.matthey.com
London Bullion Market Association	Gold and silver price fixes	www.lbma.org.uk
London Metal Exchange	Metals trading	www.lme.co.uk
Metal Bulletin	Mining Industry magazine	www.metalbulletin.com
Mining Journal	Mining Industry magazine	www.mining-journal.com
Nickel Development Institute	Nickel industry statistics	www.nidi.org
Silver Institute	Silver	www.silverinstitute.org
Steel Dynamics	Steel	www.steeldynamics.com
Steel Service Centre Institute (SSCI)	US steel data	www.ssci.org
The Aluminium Association	Aluminium industry statistics	www.aluminium.org
ULSAB	Ultra-light steel auto body	www.ulsab.org
US Defence National Stockpile	Strategic commodity stockpile	www.dnsc.dla.mil
World Bureau of Metal Statistics	Industry statistics	www.world-bureau.com
World Gold Council	Gold marketing statistics	www.gold.org

Source: Company data, RBS

Notes

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